A67218

AUSTRON MODEL 1210D SERIES
PORTABLE CRYSTAL CLOCK

INSTRUMENT SHOP

OPERATION AND MAINTENANCE

AUSTRON

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July

512-251-2341

AUSTRON INC. 1915 KRAMER LANE, AUSTIN, TEXAS 78758 (512) 836-3523 TWX 910/874-1356

WARRANTY

AUSTRON, Inc., of Austin, Texas, warrants, for one year after delivery, to the original purchaser of any product manufactured by AUSTRON, that same shall be free of defects in material and workmanship. Obligation under this warranty shall be limited to repair or replacement, at AUSTRON's discretion, of any product or part thereof which has been returned by the original purchaser with transportation prepaid, and upon examination by AUSTRON, is found to be defective. AUSTRON assumes no responsibility for loss or damage to equipment being returned for repair or replacement under the terms of this warranty.

For this warranty to be effective, the purchaser agrees that the equipment will be properly installed and maintained. Equipment which, upon examination by AUSTRON, requires repair or replacement of parts thereof as a result of improper installation, misuse, unauthorized alterations or repairs, or user negligence, such repairs or replacement of parts thereof will be made at cost.

AUSTRON makes no representation or warranty of any kind, either expressed or implied, with respect to equipment operation and procedures. Any action that the user may take in reliance upon the operation or accuracy of this equipment shall be taken solely upon the user's own responsibility and risk.

AUSTRON shall not be liable for consequential damages to purchaser, user, or any others resulting from the possession or use of this equipment.

Prior to return of a product under terms of this warranty, AUSTRON, Inc., Austin, Texas, is to be notified. Notification is to include the Model Number and Serial Number of the product and full details of the problem.

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AUSTRON MODEL 1210D PORTABLE CRYSTAL CLOCK

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1.0 GENERAL DESCRIPTION

1.1 SCOPE OF SECTION

1.1.1 This section introduces the AUSTRON Model 1210D Portable Crystal Clock. Provided here are descriptions of the equipment, operating controls, and indicators (see figure 1-1).

1.2 PURPOSE OF EQUIPMENT

1.2.1 The AUSTRON Model 1210D Clock is a compact self-contained time reference providing stable time outputs at several pulse frequencies. The timing of the output pulse can be varied over a wide range by means of a digital phase shifter, which has a resolution of 0.2 microseconds. In addition to the pulse output, the model 1210D has sinusoidal outputs. Thus, the model 1210D clock can be used to transfer time from one geographical location to another. A digital time display is also provided.

1.2.2 The case is approximately 8 1/2 inches high, 8 1/2 inches wide and 14 inches long, which facilitates portability. This case size permits upright storage under the type of passenger seat found on most commercial aircraft.

1.2.3 The AUSTRON Model 1210D Clock operates from a source of 115/230 V ac , or from 24 V dc to 28 V dc, $\pm$ 2 V dc. An internal battery pack will operate the clock for a period in excess of eight hours.

1.2.4 The AUSTRON Model 1210D utilizes high quality silicon semiconductors and integrated circuit assemblies. All resistors, capacitors, and hardware are chosen for high reliability, and where practical, to meet military requirements.

1.3 SPECIFICATIONS OF EQUIPMENT

1.3.1 The AUSTRON Model 1210D Portable Crystal Clock consists of an AUSTRON Model 1150 Crystal Oscillator, a series of dividers, a digital phase shifter, and output amplifiers which are powered by a supply (which has a voltage regulator and standby batteries). The following paragraphs provide specific information on the model 1210D.

1.3.1.1 Physical Specifications

Height:	8 1/2 inches (216 mm)
Width:	8 1/2 inches (216 mm)
Length:	15 inches (381 mm)
Weight:	22 pounds

1.3.1.2 Electrical Specifications

Input AC Voltage:	115/230 V ac ± 10% 48 - 420 Hz
Input DC Voltage:	24 - 28 V dc ± 2 V dc
Standby:	Internal Nicad battery pack provides at least eight hours of operation.
Battery Recharge:	14 to 16 hours.

1.3.1.3 Operating Specifications

Sinusoidal Outputs

Frequency:	5 MHz and 1 MHz
Level:	1 VRMS -20 +50% into 50 ohms
Harmonic Distortion:	30 dB from rated output
Spurious Signals:	60 dB from rated output

Pulse Outputs

Rate:	1 PPS
Amplitude:	+ 5 V peak minimum into 50 ohms
Width:	5 - 25 microseconds at the 50% amplitude points
Jitter:	Less than 50 nanoseconds

1.3.1.3 (Cont'd.)

**Frequency Change with Temperature:	Less than $\pm$ 2 X 10^{-10} over a temperature range of 0°C to 35°C.
Operating Temperature Range:	0°C to +50°C (35°C on High Charge).
Storage Temperature Range:	-40°C to +85°C.

**Performance of the timing outputs under various ambient conditions can be computed from the following relationship:

$\Delta\tau = 8.64 \frac{\Delta F}{F} T + 4.32KT^2$; where

$\Delta\tau$ = time gained or lost (microseconds)

$\frac{\Delta F}{F}$ = frequency offset in parts in 10^{-10}

T = time in days

k = drift rate of the oscillator expressed in parts 10^{-10}

1.4 CONTROLS, INDICATORS, AND CONNECTORS

1.4.1 Figure 1-1 shows all panel controls, indicators, and connectors for the model 1210D. Specific information is provided in the following paragraphs.

1.4.1.1 Front Panel

REFERENCE	DESCRIPTION	FUNCTION
S10	Power ON/OFF	Disconnects both ac and battery power from clock. (Note: Placing the power switch in the "off" position will stop the clock, even if it was operating from its internal battery power source.)
DS3	Power Lamp	Indicates ac operation.
S11	Charge HI/LOW Switch	Selects the rate at which the internal batteries are to be charged.
DS4	Charge Lamp	Indicates the internal batteries are charging at the high rate.
J1	EXTernal SYNC Connector	BNC connector accepts an external synchronizing pulse.
J2	5 MHz Output Connector	BNC connector provides 5 MHz sinusoidal output.
J3	1 MHz Output Connector	BNC connector provides 1 MHz sinusoidal output.
J4	1 MHz Output Connector	BNC connector provides 1 MHz sinusoidal output.

1.4.1.1 (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
J5	1 PPS Output Connector	BNC connector provides one pulse-per-second output.
S5 and M1	METER FUNCTION Switch and Meter	Three-position rotary switch selects, one of the following functions for display on meter: RF - The oscillator bias of the internal frequency standard OVEN - Oven of the internal frequency standard BATT - Voltage of the internal battery pack
R1	FINE FREQuency Control	Ten-turn precision potentiometer to accurately adjust the frequency of the internal oscillator. This control may be calibrated by dividing the electrical tuning range of the oscillator by 10^3.
S8	ADVance/RETard Slew Rate	Two-position toggle switch which advances or retards the timing pulse at a rate selected by the SLEW RATE switch, S9.
S9	SLEW RATE Switch	Five-position rotary switch which selects the rate (in microseconds/second) which the digital phase shifter slews.

1.4.1.1 (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
S7	ARM/DISARM Switch	Toggle switch which enables the clock sync and time setting functions.
DS2	ARM Lamp	This lamp being lit indicates that the clock is ARMED and the timing of its output pulse may be changed, or the HRS, MIN, or SEC display may be set by the appropriate pushbutton controls.
S6	SET/RUN Switch	Toggle switch which halts the clock register and allows updating in the SET position, or allows the clock register to accumulate time in the RUN position.
S1	DEMAND Switch	Pushbutton switch which forces the clock register to display time for about eight seconds when the ac input is absent. (Note that the time display is continuous when the ac input is present.)
DS1	1 SECond Indicator	Indicator which flashes once per second when the clock register is accumulating time.
S2	HRS SET Switch	Pushbutton switch which advances the hours clock register when the clock is in the SET mode.

1.4.1.1 (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
S3	MIN SET Switch	Pushbutton switch which advances the minutes clock register when the clock is in the SET mode.
S4	SEC SET Switch	Pushbutton switch which advances the seconds clock register when the clock is in the SET mode.
A4	Time Display Assembly	Indicates the time-of-day in hours, minutes, and seconds.

1.4.1.2 Rear Panel

REFERENCE	DESCRIPTION	FUNCTION
	COARSE FREQuency Adjustment	Access hole to allow for adjustment of the frequency at the internal frequency standard.
F1	AC Fuse	Type 3AG - 1A SLO-BLO fuse provides ac power supply protection.
F2	Battery Pack Fuse	Type 3AG - 1A SLO-BLO fuse provides protection for the internal battery pack.
F3	DC Fuse	Type 3AG - 2.5A SLO-BLO fuse provides protection for the DC standby input.
J2	EXTernal STanDard INput	BNC connector accepts external 5 MHz sine wave input with an amplitude of at least 1 V RMS into a 50 ohm load.

1.4.1.2 (Cont'd.)

REFERENCE	DESCRIPTION	FUNCTION
S4	INTernal/EXTernal STanDard Switch	Toggle switch selects operation from either internal frequency standard, or from an external 5 MHz frequency standard.

2.0 INSTALLATION

2.1 SCOPE OF SECTION

2.1.1 This section describes the steps required to prepare the AUSTRON Model 1210D Portable Crystal Clock for operation or reshipment to another location. Included in this section are instructions for unpacking, inspection, and shipping, along with lists of fundamental electrical requirements and accessories.

2.2 UNPACKING AND INSPECTION

2.2.1 Initial Inspection -- Immediately report any equipment damage to the carrier making delivery and to AUSTRON, Inc. Before applying power to the unit, visually inspect internal components and circuit boards by removing the top cover. Examine exterior and interior parts carefully for scratches, dents, damaged printed circuit boards, etc., which might indicate improper handling.

2.2.2 Circuit Boards -- Exercise care when removing or installing printed circuit boards. The recommended installation procedure is to align the board contacts with the connector, and then carefully insert the board as far as it will go.

NOTE: COMPONENT SIDE IS TOWARDS THE FRONT.

CAUTION: ALWAYS TURN POWER OFF BEFORE REMOVING OR INSTALLING ANY PRINTED CIRCUITS OR INTEGRATED CIRCUITS.

2.3 OPERATIONAL INSTALLATION

2.3.1 Accessories -- The following accessories should be received with the model 1210D:

a) One MS type mating dc power connector.
b) One cable clamp for MS type connector.
c) Two sets of spare fuses.
d) Two technical manuals.
e) One pcb extender card.

2.3.2 Power Connections -- This unit operates on 115 V ac or 230 V ac ± 10%, 48-420 Hz. Before connecting the ac power cable to the source, verify that the 115/230 volt selector switch (located on the top of the power transformer) is in the required position (115 V or 230 V), and that fuse F1 is 1 amp SLO-BLO 3 AG for 115 V operation of 0.5 amp SLO-BLO 3 AG for 230 V operation.

2.3.3 Cable Connections -- With the MS type connector supplied, fabricate a cable to supply the dc standby power. The connections are as follows:

PIN	DESCRIPTION
A	24 - 28 V dc ± 2 V dc
B	Return
C	No Connection

2.4 PREPARATION FOR RESHIPMENT

2.4.1 Turn power off and disconnect all external cables. Check to see that all mounted components are in place and secure, and that all printed circuit boards are snugly inserted in their respective connectors.

CAUTION: IF SHIPMENT OR STORAGE DURATION OF GREATER THAN THIRTY (30) DAYS OR STORAGE TEMPERATURES OUTSIDE THE RANGE OF MINUS FORTY DEGREES (-40°) CENTIGRADE TO PLUS FIFTY DEGREES (+50°) CENTIGRADE IS ANTICIPATED, THE NICAD BATTERIES SHOULD BE REMOVED BY A QUALIFIED TECHNICIAN.

2.4.2 Use the original packing material for shipping, if possible. If not, enclose the unit in a suitable water and vapor proof plastic bag. Projections and sharp edges should be padded with a cushioning material. Heat seal or tape the plastic bag to ensure a moistureproof enclosure. When sealing the bag, keep the trapped air volume to a practical minimum.

2.4.3 Place the unit in a interior box of such dimensions that will not allow movement. Place the interior box in a shipping container of such dimensions that will allow for at least two inches of rubberized hair (or similar material) on all sides of the interior box.

3.0 OPERATION INSTRUCTIONS

3.1 SCOPE OF SECTION

3.1.1 This section provides instructions for operating the AUSTRON Model 1210D Portable Crystal Clock. Included are general descriptions of set-up, check out, and adjustment.

3.2 SET-UP AND TURN-ON PROCEDURES

3.2.1 After installing the model 1210D per section 2.3, place the power switch (1A2S10) in the ON position (up). Verify that the PWR lamp (1A2DS3) is lighted, indicating ac operation. The digital time display should light.

3.2.2 Position the METER FUNCTION switch (1A2S5) as indicated, and verify the following:

a) RF - a reading above 30.
b) OVEN - an initial reading below 15. This reading will increase between 35 and 65 as the oscillator oven stabilizes.

3.2.3 Position the METER FUNCTION switch in the BATT position, and disconnect the ac and dc power cords. Note that the PWR lamp (1A2DS3) is off, and there should be no significant change in the meter reading. Reinsert the ac power cord, and verify that the PWR lamp is on. Place the CHARGE rate switch (1A2S11) in the HI position. Verify that the CHG lamp (1A2DS4) is on, and that the meter shows a slight movement up-scale. Place the CHG switch in the LOW position.

3.2.4 At this point in the operating procedure a 3 hour delay is necessary in order to allow the internal oscillator time to warm-up. In the interim, the following procedure may be performed to verify the complete operation of the clock controls and outputs:

3.2.4.1 Check the 5 MHz and 1 MHz sine outputs and the 1 PPS pulse output with an oscilloscope. These outputs should conform to the specifications listed in paragraph 1.3.

3.2.4.2 Place the ARM/DISARM switch (1A2S7) in the ARM (up) position. Verify that the ARM lamp (1A2DS2) lights. Place the ARM/DISARM switch in the DISARM (down) position. Verify that the ARM lamp extinguishes.

3.2.4.3 Arm the clock and place the clock SET/RUN switch (1A2S6) in the SET position. The digital display should hold the time being display. Place the clock SET/RUN switch in the RUN position. Verify that the seconds increment. Disarm the clock by placing the ARM/DISARM switch in the DISARM position.

3.2.4.4 Verify the function of the EXT SYNC in the following manner. ARM the clock and apply a 1 PPS (+3V for 1 microsecond or greater) pulse to the EXT SYNC input (1A2J1). The ARM lamp should extinguish indicating that synchronization has occurred. Verify the synchronization by comparing the synchronizing pulse and clock output pulse. The pulses should be within 0.4 microseconds of each other.

3.2.5 Approximately 3 hours after turning the Model 1210D on, the frequency of the internal oscillator should be within the adjustment range of the front panel frequency control. Using a meter standard and the FINE FREQ control (1A2R1), adjust the internal oscillator of the model 1210D on frequency.

3.3 TIME SYNCHRONIZATION

3.3.1 The model 1210D clock may be synchronized with a master clock automatically or manually.

3.3.1.1 Automatic Synchronization -- Automatic synchronization is accomplished by placing the ARM switch in the ARM (up) position. The red ARM lamp, located immediately above the ARM/DISARM switch, will light indicating that the clock is ready to receive a timing command. Next, connect the master timing pulse to the EXT SYNC BNC connector located on the front panel of the model 1210D clock. When the master timing pulse arrives, the clock will automatically synchronize to within 0.4 microsecond timing pulse. The ARM lamp will go out, indicating synchronization has taken place.

3.3.1.2 Manual Synchronization -- Manual synchronization is accomplished by using an oscilloscope, with a triggered sweep, as a comparator and aligning the clock with the master clock pulse as follows:

1) Trigger the sweep of the oscilloscope with the external master timing pulse.
2) Connect the 1 PPS output from the model 1210D to the vertical input of the oscilloscope. Set the vertical gain to 1 volt per division and the sweep rate to 0.1 second per division. The model 1210D clock output pulse should appear on the base line.
3) ARM the clock, and select a high slew rate by means of the SLEW RATE switch (1A2S9). The slew rates, shown on the righthand side of the selector switch, are expressed in microseconds per second.
4) Advance or retard the model 1210D clock output pulse at the rate selected, by means of the SLEW RATE ADV/RET switch (1A2S8). As the time difference decreases, select slower slew rates and faster sweep rates until the model 1210D is synchronized.
5) Disarm the clock.

3.4 TIME DISPLAY SYNCHRONIZATION

3.4.1 Alignment of the clock display to the master clock is done as follows:

1) Position the SET/RUN switch (1A2S6) to the SET position.
2) ARM the clock.
3) Using the HRS, MIN, or SEC pushbutton switches (1A2S2 - 1A2S4), advance the display to several seconds ahead of the desired display time.
4) When real time is in coincidence with the digital display, place the SET/RUN switch in the RUN position.
5) Disarm the clock.

3.5 BATTERY CHARGING

3.5.1 Due to the difficulty in determining the state of charge of the Nicad batteries, the following procedure is recommened for recharging the cells:

1) Place the CHG switch on the HI position.
2) Compute the charging time using the following information:
   a) The clock draws approximately 420 ma when operating from the internal batteries.
   b) The batteries have a 7 ampere hour capacity.
   c) The HI charge rate is approximately 750 ma.
   d) Replace 1-1/2 times the ampere hours used.

40-60 ON METER 3:31 AM
OVERLAP WILL GIVE FULL CHARGE ON LOW TO GOOD BATTERY PACK (PER CHUCK PEARY OF AUSTRON)

3.5.2 The most important thing is to not allow the heat to build up during the charge cycle. Therefore, at frequent intervals during a prolonged charge cycle, the batteries should be tested with the back of the hand. If the batteries should become uncomfortable to the touch, the charge rate switch should be set to LOW until the batteries have cooled. The charge may then be resumed at the HI rate until the computed charge time is completed.

3.5.2 (Cont'd.)

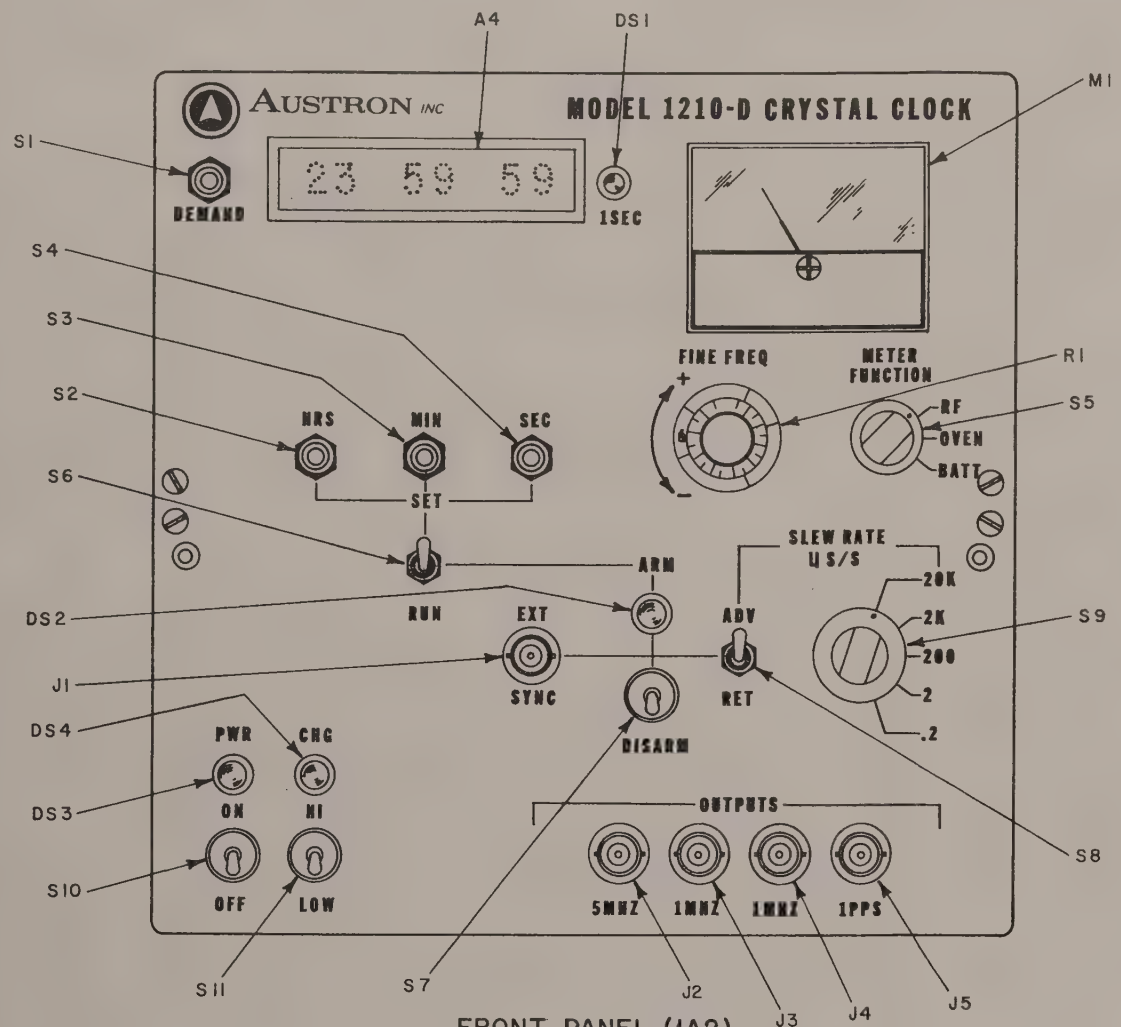
NOTE: Nickel cadmium batteries have a memory. After repeated shallow discharge/charge cycles the batteries should be discharged to 1 volt per cell and then recharged 14 hours. This will restore the batteries to their maximum capacity.

4.0 FUNCTIONAL DESCRIPTION

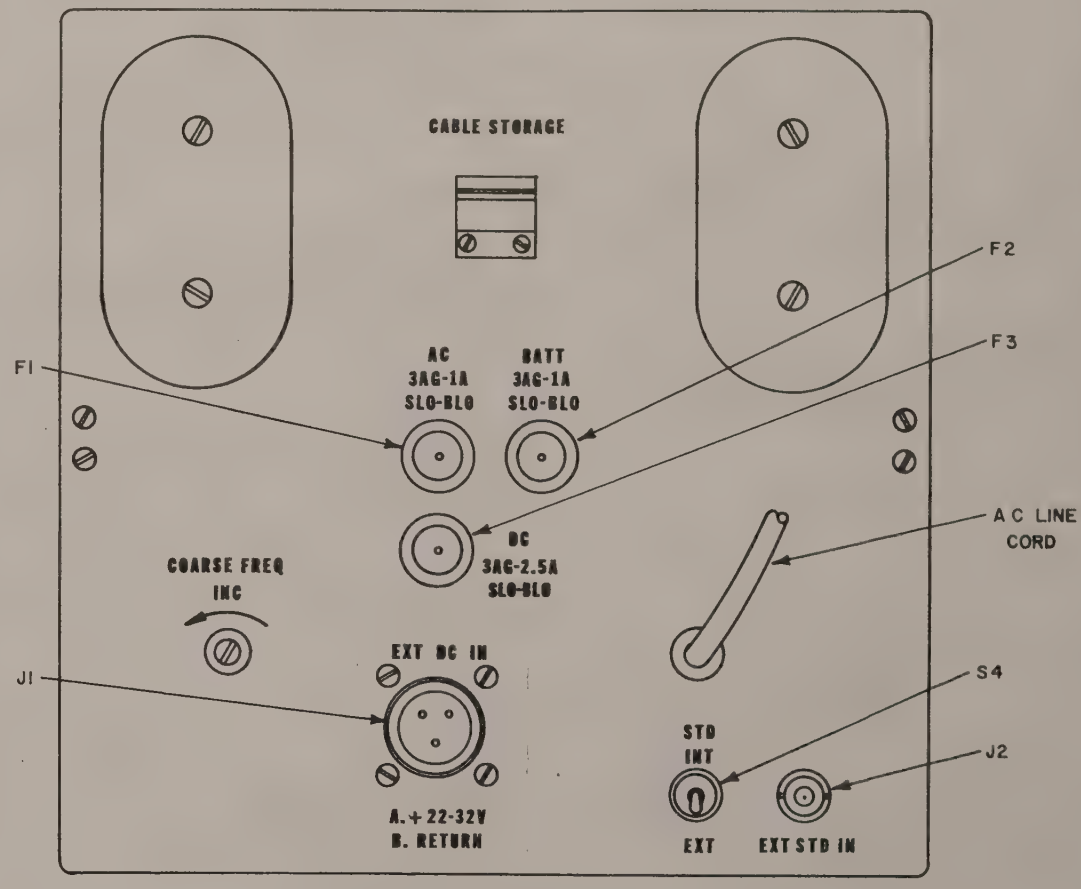
4.1 SCOPE OF SECTION

4.1.1 This section provides a functional analysis of the Model 1210D Portable Crystal Clock. The clock consists of the circuits shown in the diagrams in Figures 4-1 and 4-2. Each circuit will be discussed separately in this section.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASE	2-1-78	VJS
	A	COMBINED WITH 124 96785 PER ECO # 2251	2-15-78	AJS



FRONT PANEL (1A2)

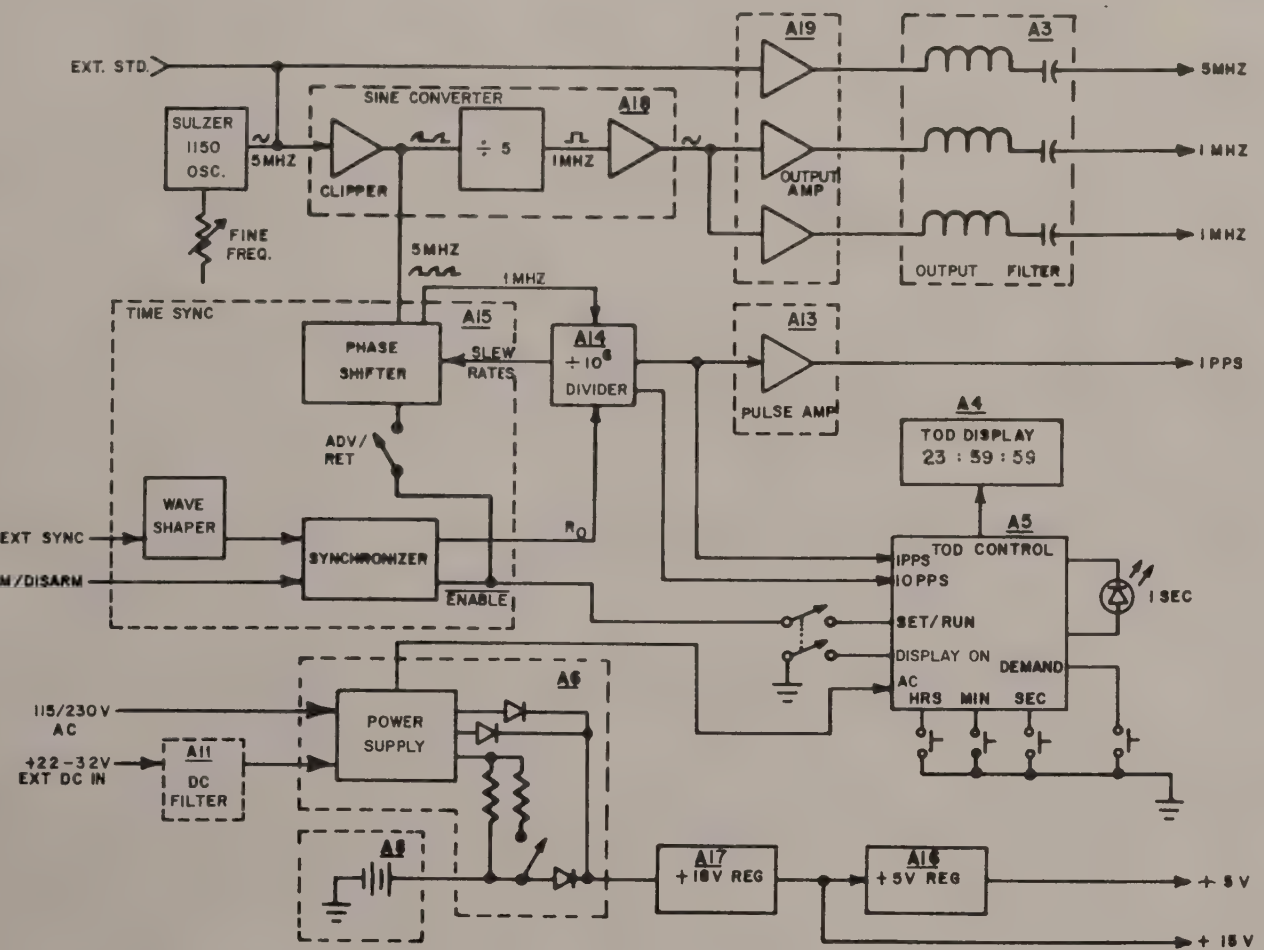


REAR PANEL (1A10)

				TOLERANCES UNLESS OTHERWISE SPECIFIED	AUSTRON INC. AUSTIN, TEXAS
				DECIMALS / FRACTIONS / ANGLES	FRONT AND REAR PANEL CONTROLS - MODEL 1210D
				MATERIAL:	
127 96207	1210D	1A2 / 1A10	1-1	ENGR	SIZE 3 / CODE IDENT NO 24672 / 124 96783 / A
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK	
APPLICATION				DRFTSMN BARKER 10-3-75	SCALE 1:1 / SHEET OF

4-1A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	10-9-75	



127 96207	1210D		4-1	ENGR	L.L. ISERT, JR.	10-9-75
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK	R. BARKER	10-9-75
APPLICATION				DRFTSMN	K. WIGGINTON	10-8-75

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

AUSTRON INC.
AUSTIN, TEXAS

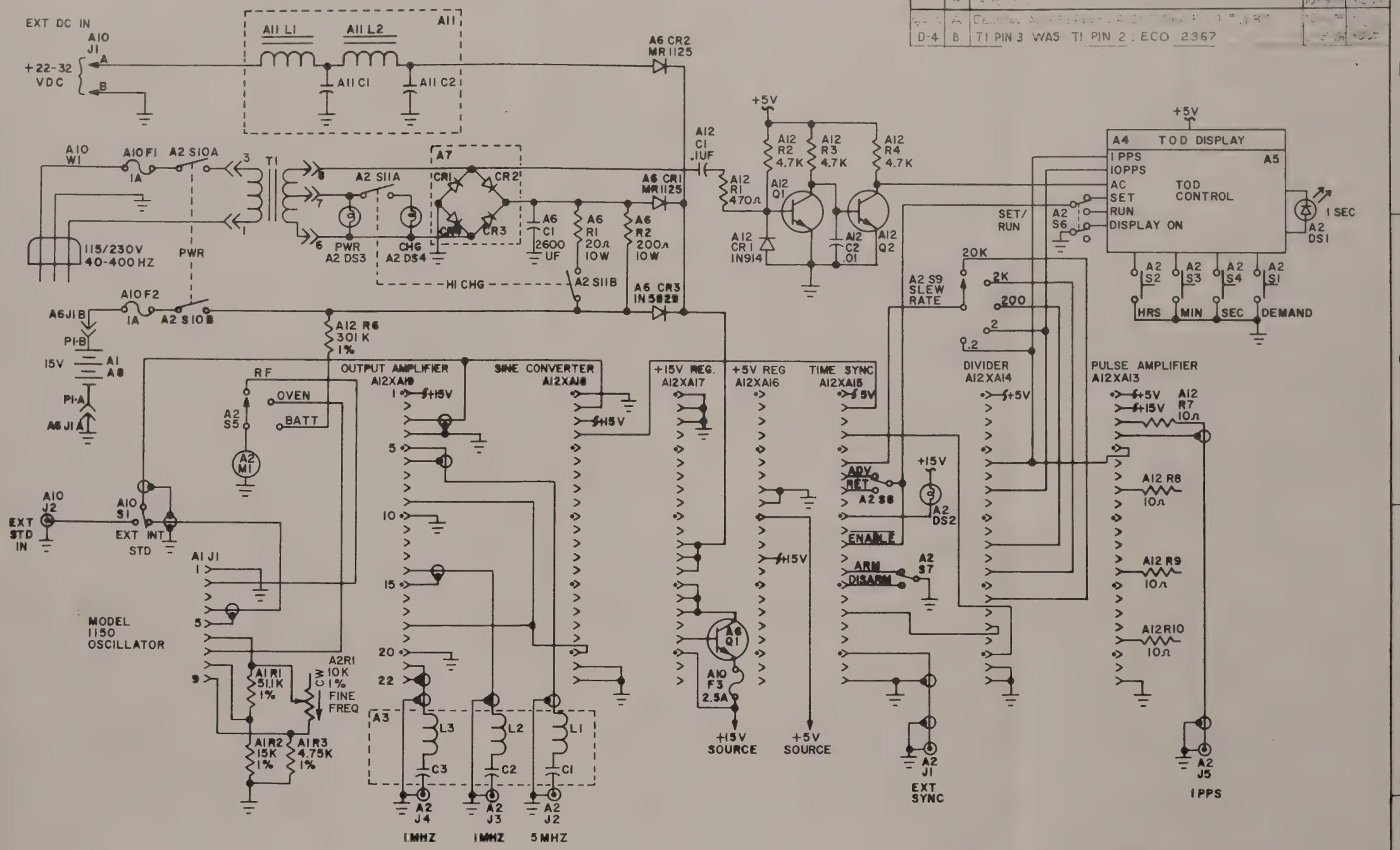
BLOCK DIAGRAM - 1210D CRYSTAL CLOCK

SIZE	CODE IDENT NO	
3	24672	124 96793

SCALE N/A SHEET 1 OF 1

4-1B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	–	[illegible]	10-[illegible]	[illegible]
[illegible]	A	[illegible]	[illegible]	[illegible]
D-4	B	T1 PIN 3 WAS T1 PIN 2 ; ECO 2367	[illegible]	[illegible]



3. A6Q1 IS AN MJE 3055.
2. A12Q1 AND A12Q2 ARE 2N3904.
1. ALL RESISTORS 1/4W 10% UNLESS OTHERWISE SPECIFIED.

127 96209	1210D		4-2
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR	L.L. ISERT, JR.	10-9-75
CHECK	R. BARKER	10-9-75
DRFTSMN	J. WILEY	10-7-75

AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC DIAGRAM -
1210D CRYSTAL CLOCK

SIZE	CODE IDENT NO		
3	24672	123 96154	B

SCALE N/A SHEET 1 OF 1

4-1C

4.2 GENERAL CIRCUIT DESCRIPTION

4.2.1 The clock's overall functions are illustrated in Figure 4-1. A 5 MHz signal from either the internal AUSTRON Model 1150 Oscillator or an external standard is used as the timing for the clock. This signal is shaped and divided by the Sine Converter in order to supply the 5 MHz and 1 MHz sine outputs.

4.2.2 After conditioning by the Sine Converter, the 5 MHz signal is applied to the Time Sync circuits. These circuits convert the 5 MHz signal to a 1 MHz signal, which is in turn applied to the divider circuits to obtain the 1 PPS output. The 1 MHz generated in the Time Sync circuits may be phase shifted manually in accordance with the SLEW RATE and ADV/RET switches in order to slew the occurrence of the 1 PPS.

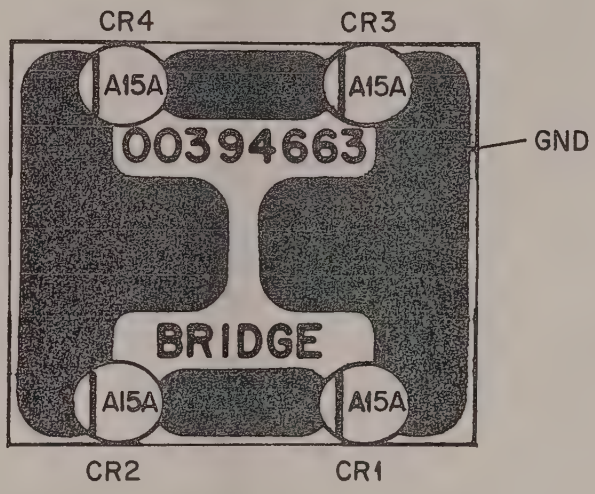
4.2.3 The output of the divider is used to generate time of day signals in the TOD Control and TOD Display circuits. An $\overline{\text{ENABLE}}$ signal generated in the Time Sync circuits allows the TOD Display to be set.

4.2.4 The power supply circuits are shown in detail on the chassis schematic Figure 4-2. AC power is obtained through the power transformer, T1, and rectified by the bridge consisting of 1A7CR1 - 1A7CR4.

4.2.5 Note that the bridge is located on a separate assembly, A7, which is shown in Figure 4-3. The output of the bridge is routed through either 1A6R1 and 1A6R2, or 1A6R2 to supply charging current for the Battery Pack, A8. 1A6CR1, 1A6CR2, and 1A6CR3 are connected as an "OR" circuit, so that either the ac power, EXT DC or batteries may supply the power to the +15 volt regulator, A17.

4.2.6 1A12Q1 and 1A12Q2 are used to detect ac power. The resultant TTL level signal is used in the TOD Control circuits.

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
221 94648	1210 C	A	REVISED PER ECO "978		ROB
110 96211	1210D	B	REDRAWN TO UPGRADE FORMAT; ECO2220	2-10-78	RJB



(1210D) A7	4-3				
REF DES	FIG NO				
		ENGINEER	L.L.I.	9-5-75	
		CHECKED	R.D.B.	9-5-75	
		DRAFTSMAN	K.WIG	9-5-75	

AUSTRON INC. AUSTIN, TEXAS

P C BOARD ASSY - BRIDGE

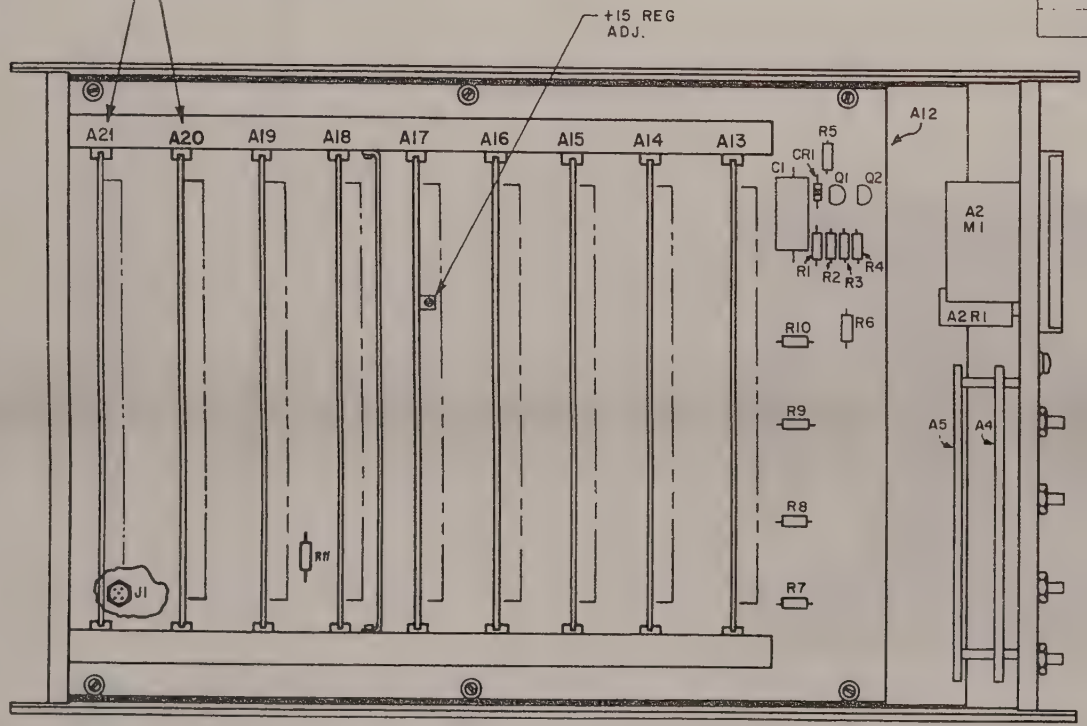
SIZE	CODE IDENT NO.		
1	24672	103 94664	B
SCALE 2:1		SHEET 1 OF 1	

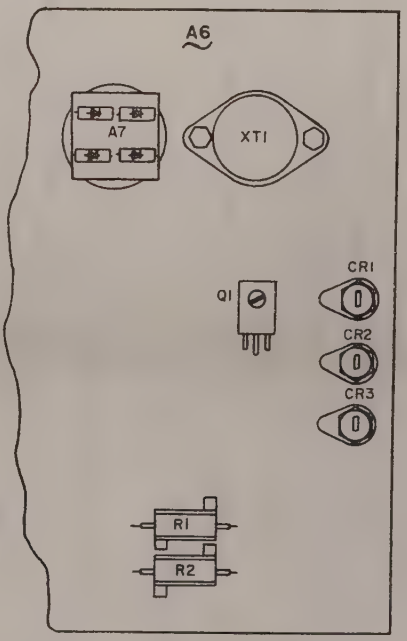
4.2.7 There are other circuits that have been packaged off the main printed circuit cards. Among these is the Output Filters assembly, A3. These filters have been mounted on a small card in the immediate proximity of the output connectors in order to further assure signal purity.

4.2.8 1A6Q1 is the series pass transistor for the +15V regulator. 1A12R7-R10 are current limiting resistors used to protect the Pulse Amplifiers' output transistors against short circuiting.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	–	RELEASED	10-9-75	RDB
	A	ADDED BOARD A20		RDB
	B	ADDED BOARD A21 & OPTIONAL NOTE; ECO 2237	2-8-78	RDB

NOTE: BOARDS A20 AND A21 ARE USED ON THE OPTIONAL VERSIONS OF THE 1210D.





127 96209	1210D		4-4
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DEC | FRAC | ANG

MATERIAL:

ENGR	L.L.ISERT	10-9-75
CHECK	R.BARKER	10-9-75
DRFTMN	K.WIG.	10-8-75

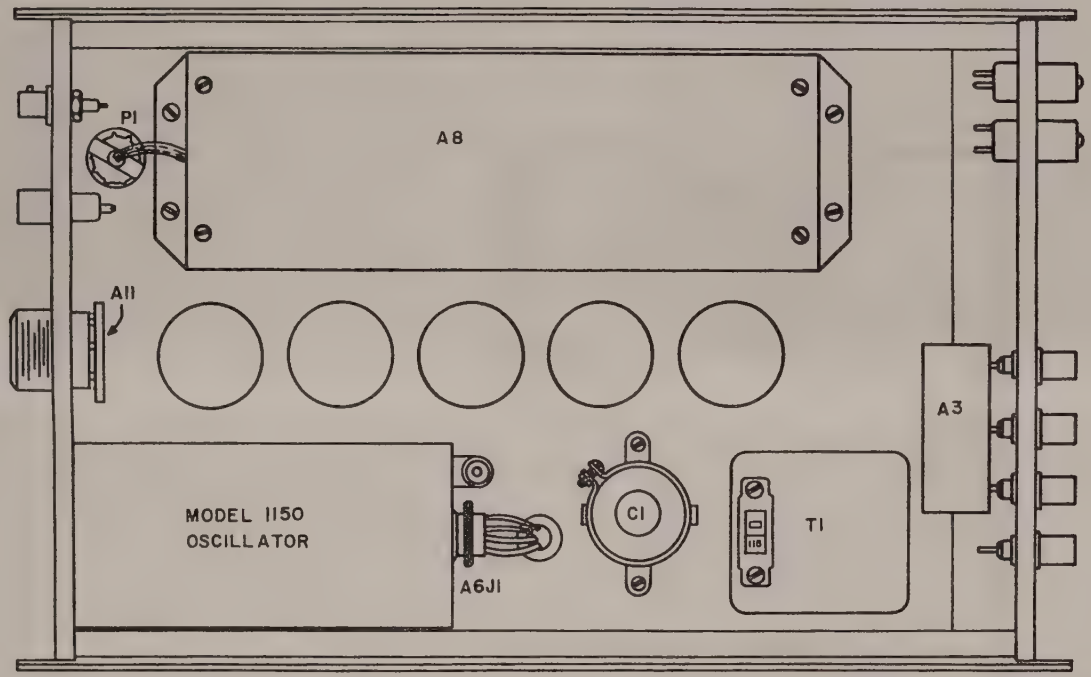
AUSTRON INC
AUSTIN, TEXAS

TOP VIEW -
1210D CRYSTAL CLOCK

SIZE	CODE IDENT NO		
2	24672	124 96787	B
SCALE NONE			SHEET 1 OF 1

4-3A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	10-9-75	KDB



127 96209	1210D		4-5
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.ISERT	10-9-75
CHECK	R.BARKER	10-9-75
DRFTMN	K.WIG	10-8-75

AUSTRON INC
AUSTIN, TEXAS

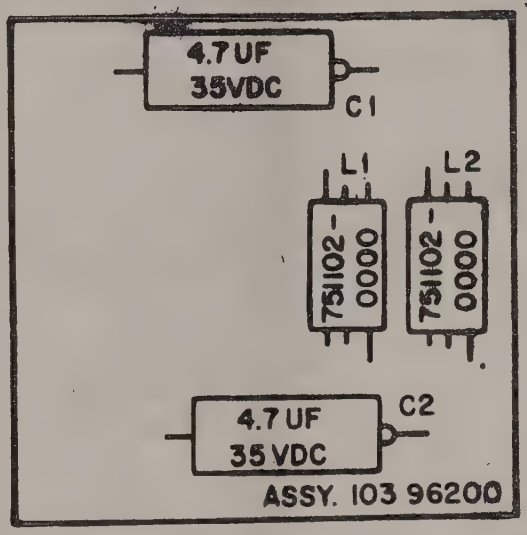
BOTTOM VIEW - 1210D CRYSTAL CLOCK

SIZE	CODE IDENT NO	
2	24672	124 96786

SCALE NONE | SHEET 1 OF 1

4-3.0

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
109 96195	1210-D	—	RELEASED	9-29-75	RDB
		A	REVISED TITLE BLOCK TO INCLUDE REF DES & FIG. NO; SCALE WAS 1:1; PER ECO 2223	2-13-78	RDB



			ENGINEER	[illegible]	9-22-75
			CHECKED	[illegible]	9-27-75
			DRAFTSMAN	BARKER	9-20-75
A11	4-6				
REF DES	FIG NO				

AUSTRON INC. AUSTIN, TEXAS

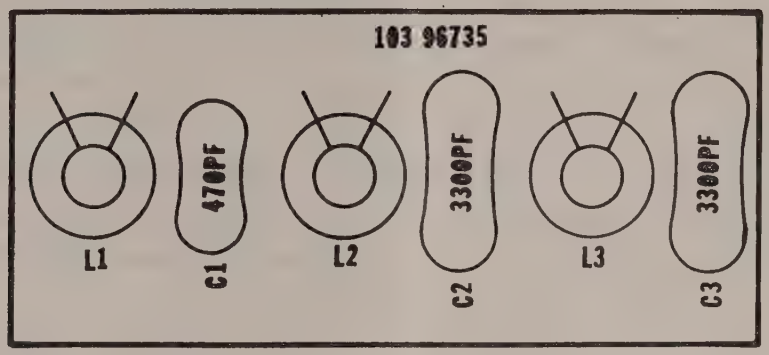
P C BOARD ASSY. -
D C FILTER

SIZE	CODE IDENT NO.		
1	24672	103 96200	A

SCALE 2:1 SHEET 1 OF 1

4-3C

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
09 96193	1210-D	—	RELEASED	9-29-75	ROB
		A	REVISED TITLE BLOCK TO INCLUDE REF DES & FIG NO; SCALE WAS 1:1; PER ECO 2222	2-13-78	RDB



NOTES:
1. MOUNT CHOKES WITH NYLON ROD.

			ENGINEER	LRA	9-22-75
			CHECKED	RDB	9-29-75
			DRAFTSMAN	BARKER	9-20-75
A3	4-7				
REF DES	FIG NO				

AUSTRON INC. AUSTIN, TEXAS

P C BOARD ASSY. – OUTPUT FILTER

SIZE	CODE IDENT NO.		
1	24672	103 96735	A

SCALE 2:1 SHEET 1 OF 1

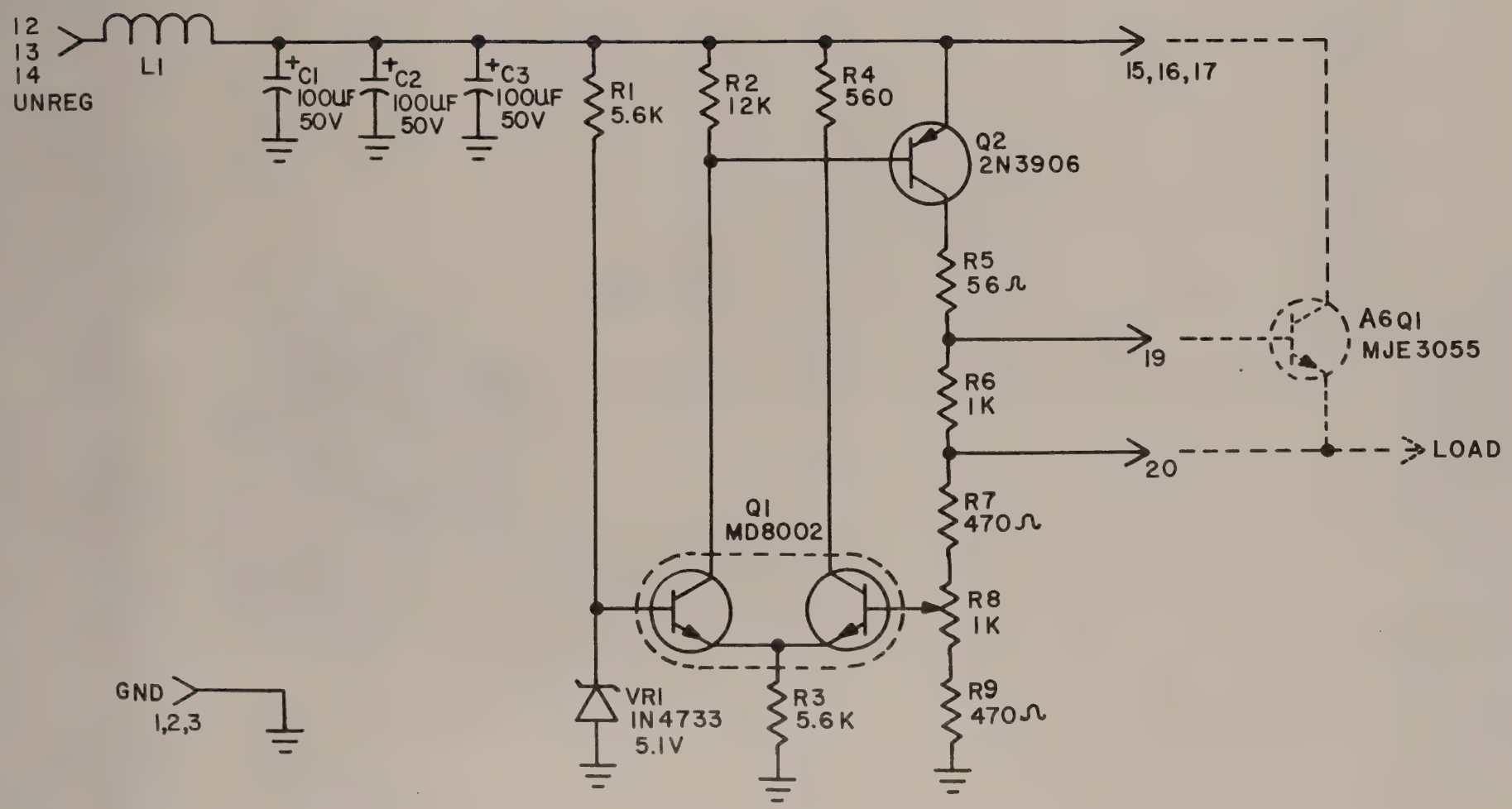
4-3D

4.3 +15 V REGULATOR

4.3.1 The 15 Volt Regulator (A17) is a series regulator that operates in the following manner:

4.3.2 The inductor L1 and capacitors C1, D2 and C3 form a decoupling network. The error voltage between diode VR1 and resistor R8 is amplified by a differential amplifier, Q1 and then by transistor Q2. Transistor Q2 drives a series pass transistor, located on the chassis. When the output of the regulator increases above the set point, the collector current thru R2 decreases, reducing the collector current of Q2 and decreasing the drive to the series pass transistor, thereby decreasing the output voltage of the regulator. When the regulator output decreases below the set point, the collector currents and drive currents increase, thereby increasing the output voltage of the regulator.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-10-75	RDB
	A	R1 WAS "SELECTED"; DELETED NOTE 1; ECO 1190	12-16-75	RDB
	B	REVISED TITLE BLOCK TO INCLUDE REF DES & FIG NO.; PER ECO # 2224	2-13-78	RDB



NOTES: UNLESS OTHERWISE SPECIFIED

103 96197	1210D	A17	4-8
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.L.I., JR.	10-10-75
CHECK	R.D.B.	10-10-75
DRFTMN	K. WIG	10-6-75

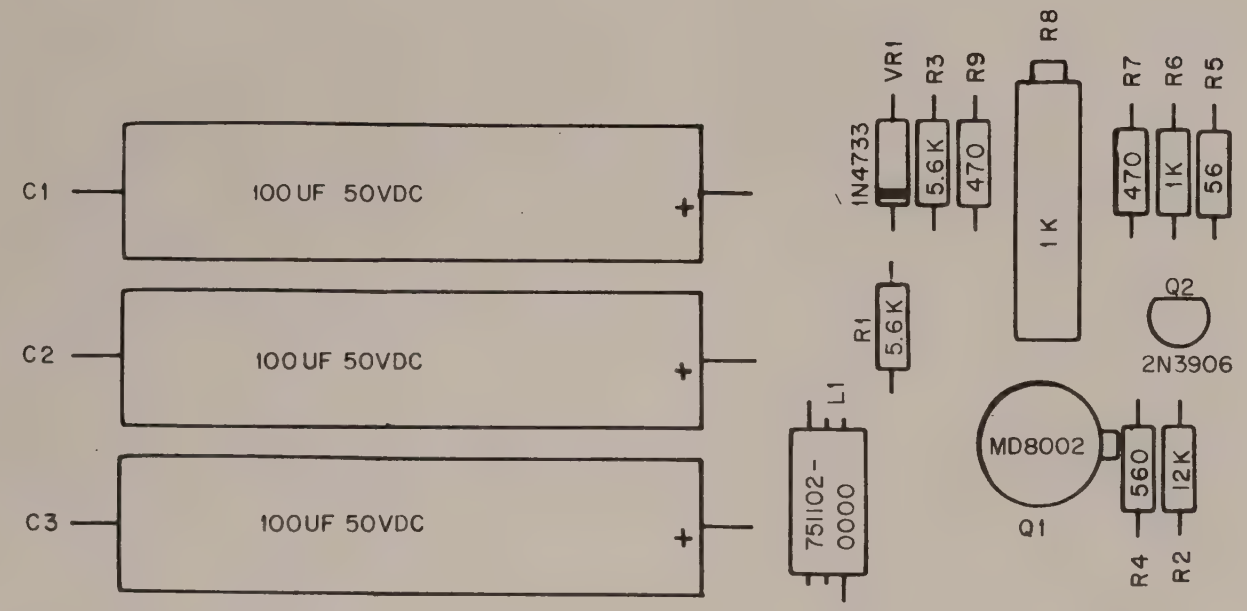
AUSTRON INC
AUSTIN, TEXAS

SCHEMATIC DIAGRAM - +15 VDC REGULATOR

SIZE	CODE IDENT NO		
2	24672	123 96784	B
SCALE N/A		SHEET 1 OF 1	

4.4A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	9-29-75	RDB
	A	R1 WAS SELECTED; TITLE WAS +18 VDC REGULATOR; PER ECO # 1190	12-16-75	RDB
	B	REVISED TITLE BLOCK TO INCLUDE REF DES & FIG. NO.; SCALE WAS 1:1; PER ECO 2225	2-13-75	RDB
	C	REVISED PARTS LIST ECO 2565	11-20-78	RDB
	D	REVISED PARTS LIST ECO. 2890	4-16-79	RDB



ASSY 103 96197

271 96208	1210D	A17	4-9
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.L.I., JR.	9-29-75
CHECK	R.D.B.	9-22-75
DRFTMN	BARKER	9-20-75

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY-
+15 VDC REGULATOR

SIZE	CODE IDENT NO		
2	24672	103 96197	D
SCALE 2:1			SHEET 1 OF 1

4-4B

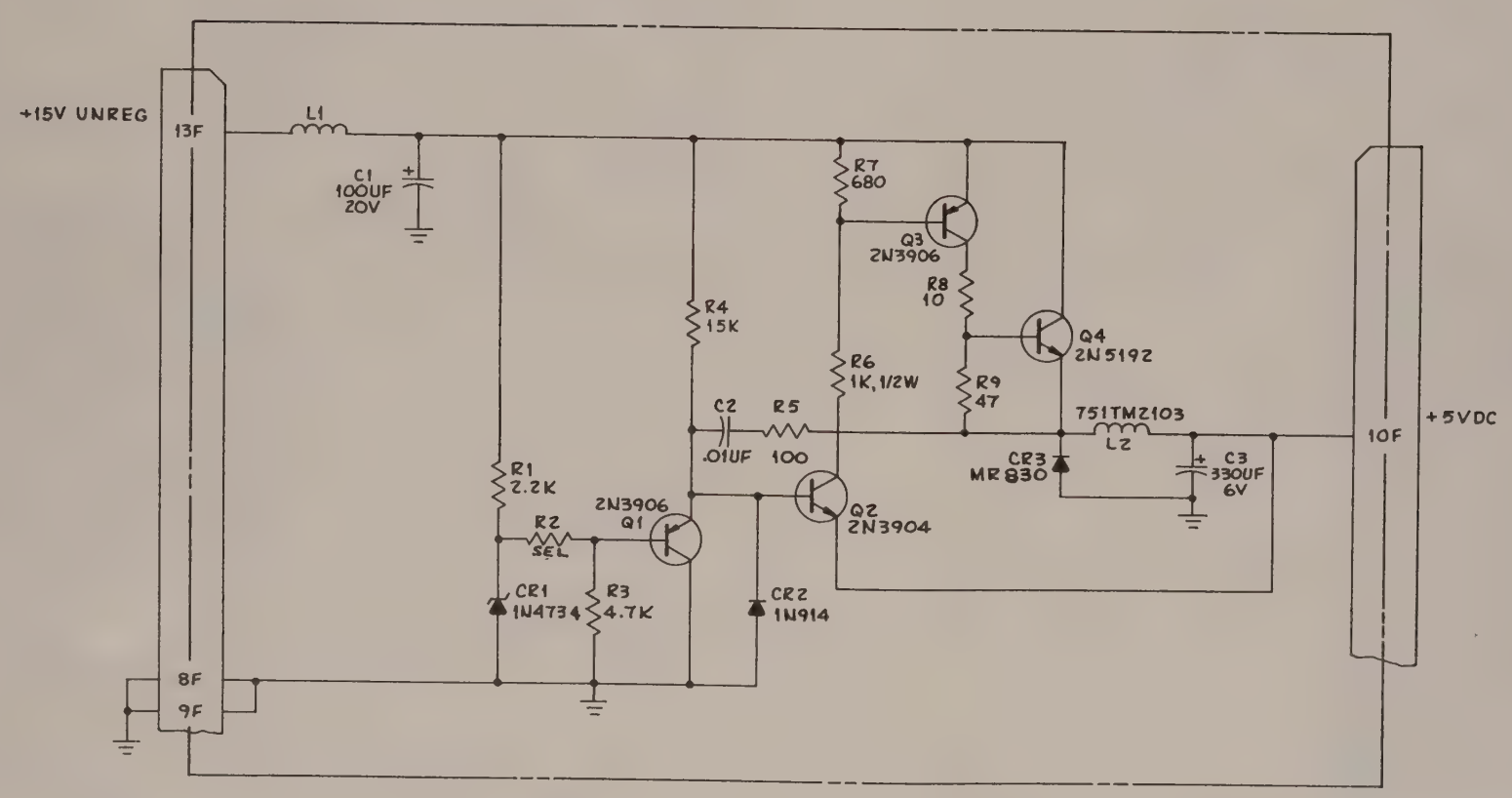
4.4 +5 V DC REGULATOR

4.4.1 The +5 V DC Regulator assembly (A16) contains a high efficiency switching mode regulator.

4.4.2 A voltage, determined by CR1, is adjusted by means of a voltage divider, R2 and R3, and applied to the base of Q1. The voltage at the emitter of Q1 is the reference voltage for the switching mode regulator.

4.4.3 When the power is first applied, the voltage at the junction of the emitter of Q1 and the base of Q2 is greater than the voltage at the emitter of Q2. Q2 is allowed to conduct, turning on Q3 and Q4. The voltage across C3 begins to rise toward the supply voltage and reaches a point where it is higher than the voltage at the base of Q2. Q2 turns off, turning off Q3 and Q4. L2 and C3 deliver current to the load until such time that the voltage at the emitter of Q2 falls below the base voltage, causing the cycle to start over again. The duty cycle of the resultant oscillation will depend on the unregulated supply voltage and the load current. CR3 clamps L2 to ground during the time Q4 is cut off.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	B	ADDED BORDER & TITLE BLOCK - NO CHANGE	2-10-78	RDB
	C	MR830 WAS MR840 PER ECO, 3066	10-2-79	RDB

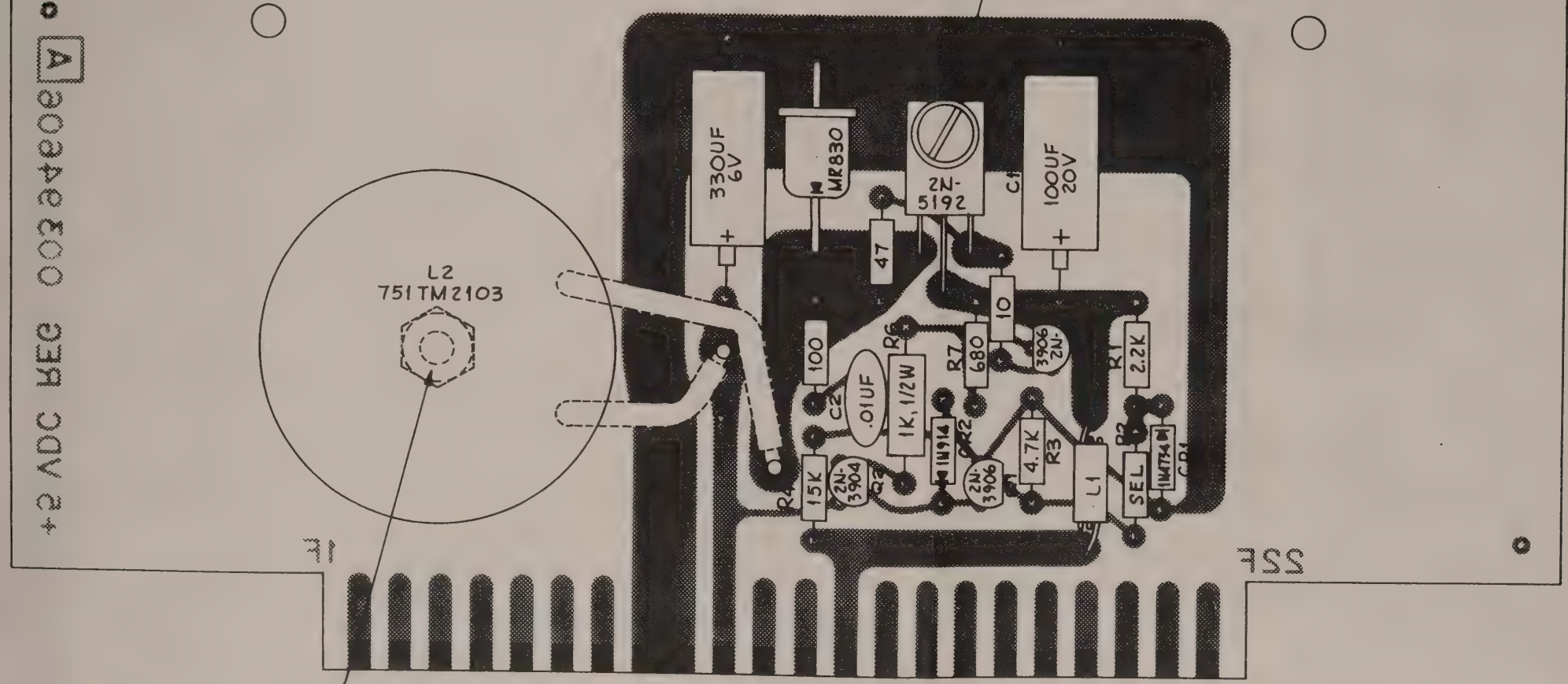


				TOLERANCES UNLESS OTHERWISE SPECIFIED			AUSTRON INC AUSTIN, TEXAS			
				DEC	FRAC	ANG	SCHEMATIC DIAGRAM - +5 VDC REGULATOR			
				MATERIAL:						
	1210C	PCB4								
103 94607	1210D	A16	4-10	ENGR	C.J.B.	4-10-73	SIZE 2	CODE IDENT NO 24672	123 94684	C
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK						
APPLICATION				DRFTMN	L.D.B.	4-10-73	SCALE N/A		SHEET 1 OF 1	

4-5A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	C	REDRAWN ON TITLE BLOCK SHEET W/O CHG. ECO 2219	2-14-78	ROB
	D	P/L CHANGE PER ECO 2723 DW	3-27-79	ROB
	E	REVISED PARTS LIST PER ECO. 2889	4-16-79	ROB
	F	REVISED PARTS LIST PER ECO. 2918	6-20-79	ROB
	G	MR830 WAS MR840 PER ECO. 3066	10-2-79	ROB

#4-40 x 3/8 BIND. HD. SCREW
#4 INT. LOCK WASHER
#4-40 HEX NUT



#6-32 HEX NUT
#6 INT. LOCK WASHER

27196208	1210D	A16	4-11
27194537	1210C	PCB4	
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DEC | FRAC | ANG

MATERIAL:

ENGR	C.J.B.	4-10-73
CHECK		
DRFTMN	L.D.B.	4-10-73

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY -
+5 VDC REGULATOR

SIZE	CODE IDENT NO	
2	24672	103 94607

SCALE 2:1 | SHEET 1 OF 1

4-5B

4.5 SINE CONVERTER

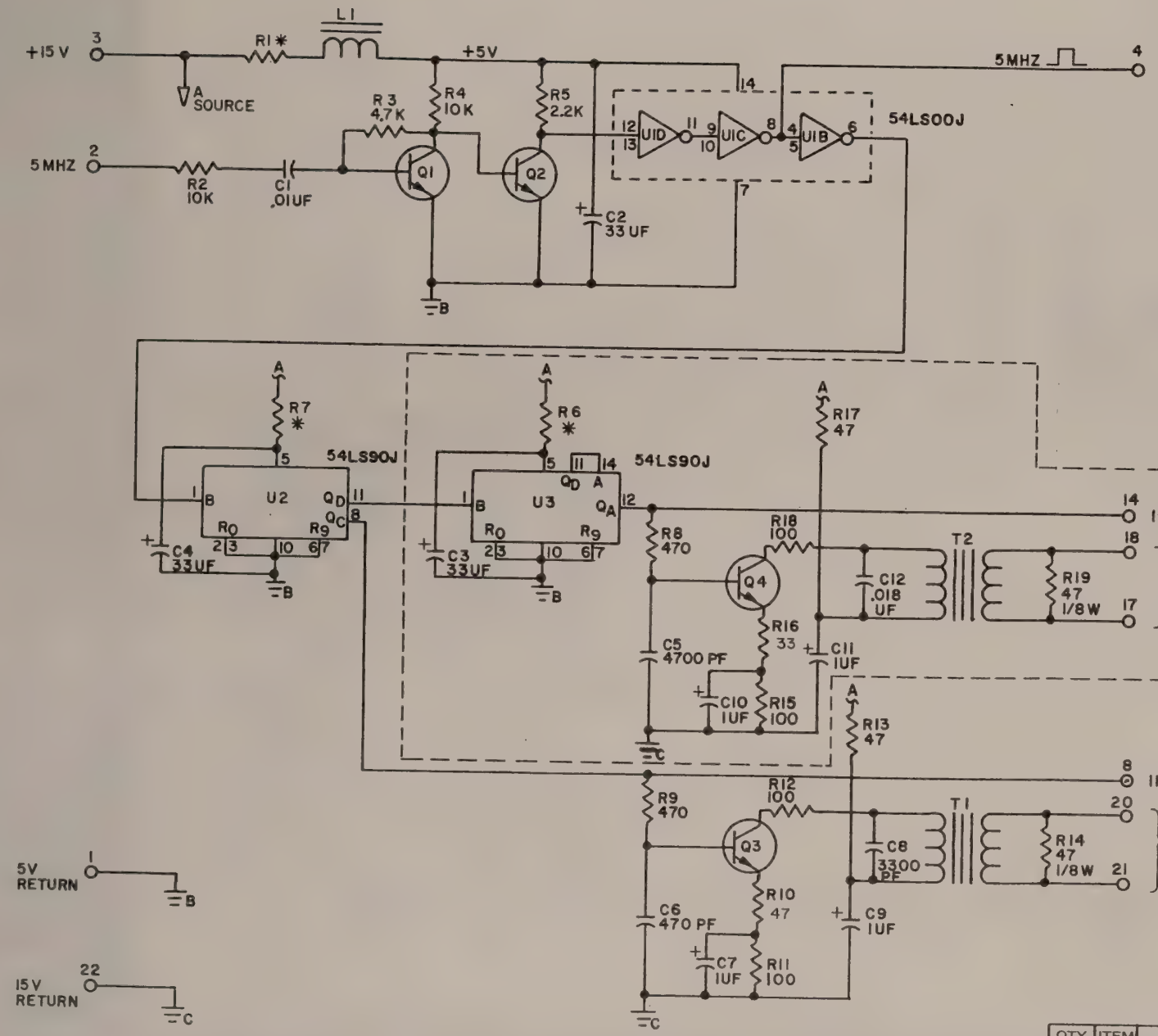
4.5.1 The Sine Converter assembly (A18) contains a 5 MHz clipper, 5 MHz buffer gates, a divide by 5 stage, a decade divider and two sine converter, buffer amplifiers.

4.5.2 The 5 MHz sinewave from the internal oscillator is supplied through isolating resistor R2 and coupling capacitor C1 to the input of a two-stage direct-coupled amplifier made up of Q1 and Q2. The output of this amplifier is a 5 MHz pulse which has the proper characteristics to drive U1B, C, D, and 5 MHz buffer gate. The output of U1B is a 5 MHz signal which is supplied to U2.

4.5.3 U2 is a divide-by-five stage which produces a 1 MHz output from the 5 MHz input. The 1 MHz output from U2 is fed through a low pass filter R9, C6, to the base of Q3, a collector tuned RF amplifier. The resulting 1 MHz sinewave at the secondary of R1 is used to drive a 1 MHz output buffer.

4.5.4 U3 is a decade divider which produces a 100 kHz output from a 1 MHz input supplied from U2. The 100 kHz signal is fed through a low pass filter R8 and C5 to the base of Q4, a collector tuned output amplifier. The 100 kHz signal present at the secondary of T2 is used to drive a 100 kHz output buffer.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-9-75	RDB
	A	ADDED DASHED LINE TO 100KHZ SECTION; R16 WAS 47; R10 WAS 33 PER ECO 1460	5-18-76	RDB
	B	STANDARDIZED ON F400 J'S PER ECO 1058, 2087	9-23-77	RDB



NOTES:
1 * R1, R6, AND R7 ARE SELECTED TO PROVIDE 5V TO THE RESPECTIVE IC.
2 ALL RESISTORS ARE 1/4 W 10% UNLESS NOTED.
3 ALL TRANSISTORS 2N 3904
4 IC'S ARE SELECTED FOR AMBIENT TEMPERATURE REQUIREMENT OF THE UNIT.

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1			LIST OF MATERIAL		

1A1A4	4-3	127 97317	1250A
A18	4-12	103 96025	1210 D
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWINGS

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGINEER	[illegible]	10-7-75
CHECKED	[illegible]	10-9-75
DRAFTSMAN	Jim Wiley	

AUSTRON INC. AUSTIN, TEXAS

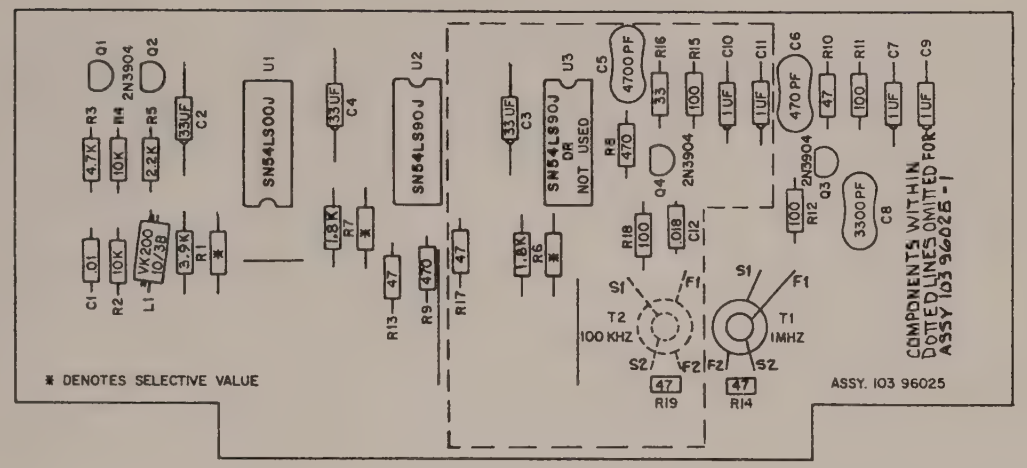
SCHEMATIC DIAGRAM
SINE CONVERTER

SIZE	CODE IDENT NO.	123 96096
3	24672	

SCALE NONE SHEET 1 OF 1

4-6A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-7-75	RDB
	A	REVISED TO ADD "-1" PER ECO #1191	12-31-75	RDB
	B	ADDED DASH LINES & "OPTIONAL" PER ECO 1459	5-18-76	RDB
	C	ADDED S&F DESIGNATORS TO T1 & T2 PER ECO 1856	3-16-77	RDB
	D	STANDARDIZED ON 5400 J'S PER ECO. 2058, 2087	9-23-77	RDB
	E	CORRECTED TYPE NO. OF U2 & U3 PER ECO 2234	2-13-78	RDB
	F	REVISED PARTS LIST PER ECO. #2810	4-16-79	RDB
	G	REVISED SILKSCREEN PER ECO. # 3088	9-24-79	RDB



QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1		LIST OF MATERIAL			

A18		271 96208-1	1210D-01
1A1A4	4-4	254 95205 *	1250A
A18	4-13	271 96208	1210D
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DEC	FRACT	ANG

MATERIAL:

ENGINEER	RDB	10-9-75
CHECKED	RDB	10-9-75
DRAFTSMAN	BARKER	10-7-75

AUSTRON INC AUSTIN TEXAS

P C BOARD ASSY - SINE CONVERTER

SIZE	CODE IDENT NO		
2	24672	103 96025 *	G

SCALE 1:1 SHEET 1 OF 1

1. FOR 10396025-1 DO NOT INSTALL COMPONENTS IN THE AREA WITHIN THE DOTTED LINES.

NOTES

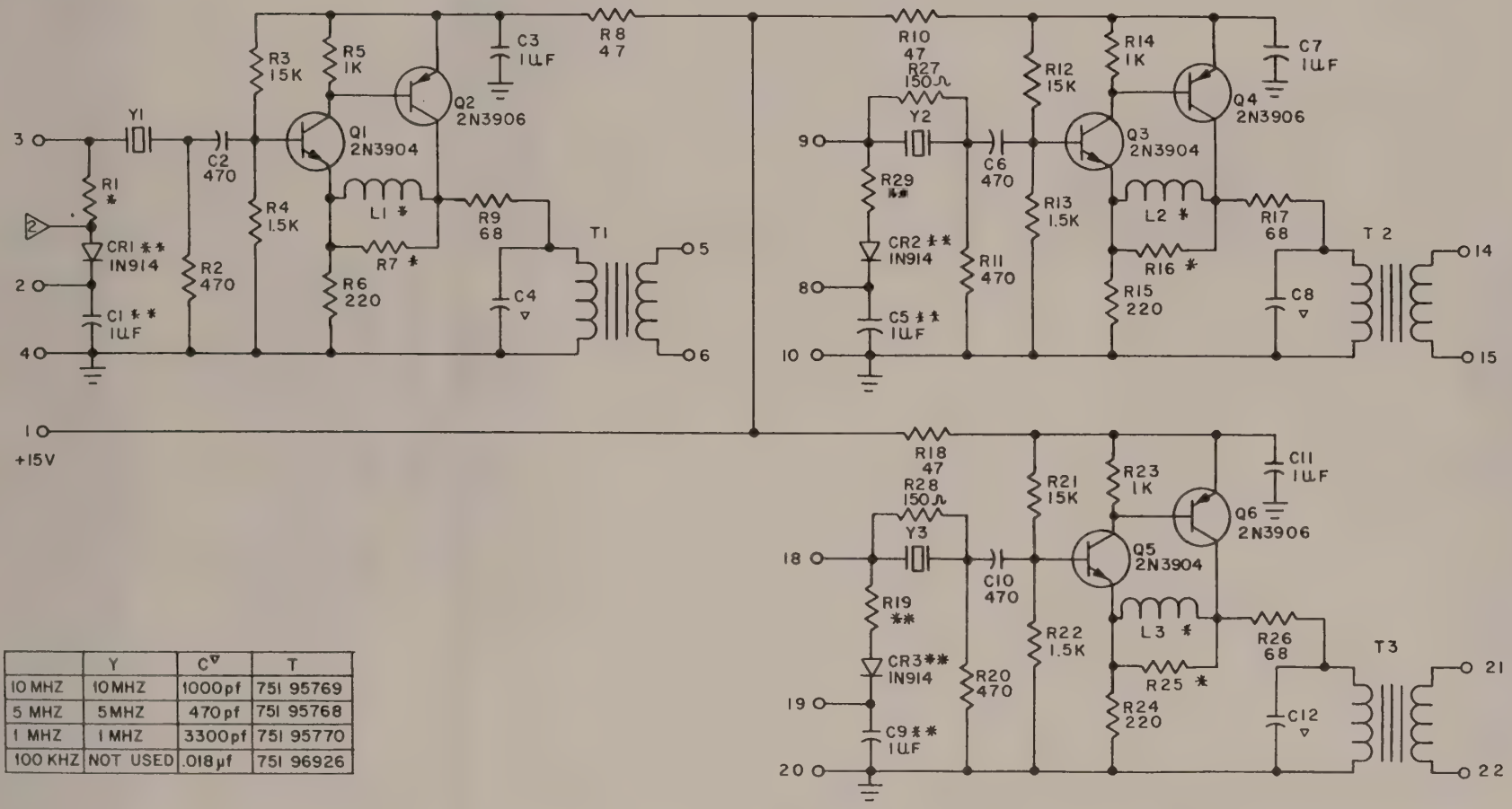
4-6B

4.6 OUTPUT AMPLIFIERS

4.6.1 The Output Amplifier assembly (A19) contains three similar amplifiers which operate in an analogous manner. This description will consider the 5 MHz amplifier.

4.6.2 Crystal Y1 is an input filter with R2 as its load. The transistors Q1 and Q2 form a two-stage common emitter, collector tuned amplifier with negative feedback. The feedback ratio is determined by R7 and R6. These amplifiers have been designed to allow a minimum level change for a maximum load change.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	RELEASED	11-26-75	R DB
	A	ECO 1273 (1) ADDED R 27, R28, AND NOTE 2	2-17-76	R DB
	B	ADDED REF TO R1 IN NOTE 2; DELETED VALUES FROM R7, R16, & R25 PER ECO 1463	5-18-76	RDB
	D	R29 WAS R9; R29, R19 AND CR3 WERE ANOTATED WITH JUST A SINGLE ASTERISK, DELETED @ TWO PLACES PER ECO 2261	3-7-78	RDB



	Y	C▽	T
10 MHZ	10 MHZ	1000 pf	751 95769
5 MHZ	5 MHZ	470 pf	751 95768
1 MHZ	1 MHZ	3300 pf	751 95770
100 KHZ	NOT USED	.018 µf	751 96926

② THIS POINT IS GROUNDED ON 1210-D AND R1 IS 47 OHMS.
** USED ON 1250 ONLY -- PARTS ARE OMITTED IN 1210D.
1.* SELECTED FOR OUTPUT LEVEL IV RMS INTO 50 OHMS
NOTES

NEXT ASSY	USED ON	REF DES	FIG NO
103 96031	1250		
103 96031-1	1210D	A19	4-14
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL:

ENGR	L.L. ISERT, JR	10-4-75
CHECK	R. BARKER	10-4-75
DRFTSMN	K. WIGINTON	9-30-75

AUSTRON INC.
AUSTIN, TEXAS

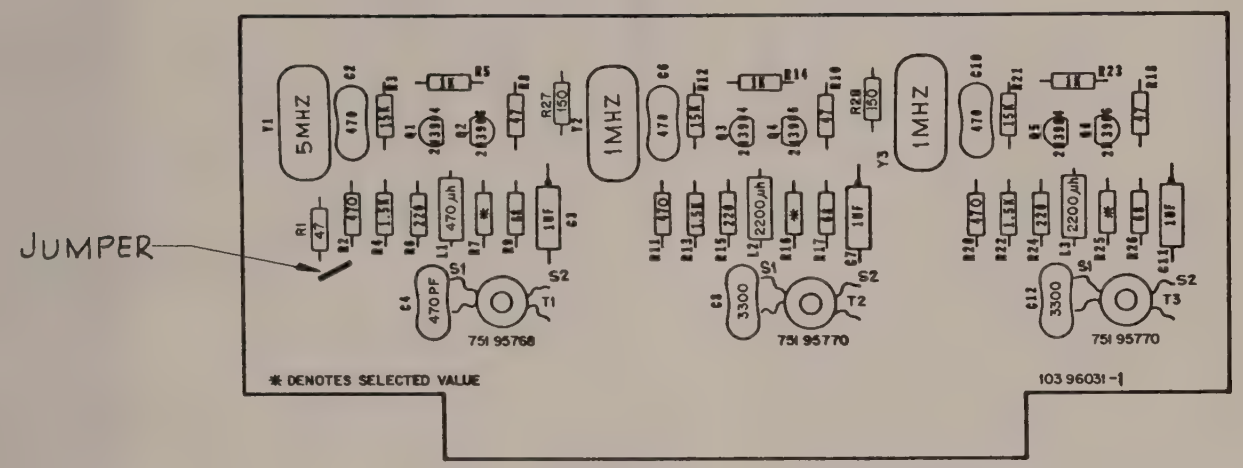
SCHEMATIC DIAGRAM - OUTPUT AMPLIFIER

SIZE	CODE IDENT NO	
3	24672	123 96098

SCALE N/A | SHEET 1 OF 1

4-7A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	–	RELEASED	10-7-75	RDB
	A	ECO 1273 (1) REVISED EXTENSIVELY (2) DELETED -1	2/16/76	RDB
	B	REINSTATED DASH 1 AND ADDED DASH No. DESCRIP. BLOCK PER ECO 1368	5-6-76	RDB
	C	ADDED VALUES TO Y1, Y2 & Y3; ADDED S1 & S2 TO T1, T2 & T3; PER ECO # 1855	3-16-77	RDB



DASH	DESCRIPTION	USED ON
NO DASH	NO LONGER IN PRODUCTION REPLACED BY 103 96986	1250
-1	AS SHOWN	1210D

271 96208	1210D	A19	4-15
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.ISERT	10-9-75
CHECK	R.BARKER	10-9-75
DRFTMN	R.BARKER	10-7-75

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY-
OUTPUT AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	103 96031 *	C
SCALE 1:1		SHEET 1 OF 1	

4-7B

4.7 TIME SYNC

4.7.1 The Time Sync assembly (A15) contains a digital phase shifter and circuits which allow the clock to be synchronized by an external signal.

4.7.2 The digital phase shifter is made up of U1, U2, U3, and the A section of U4. The phase shifter accepts a 5 MHz signal from the 1 MHz/5 MHz Output card and normally divides it by 5. On command however, the divider can be forced to divide by 4 or 6, thus "adding" or "subtracting" cycles at a rate selected by the setting of S6. The rate commands are supplied through U3D. The direction command is supplied through U3B.

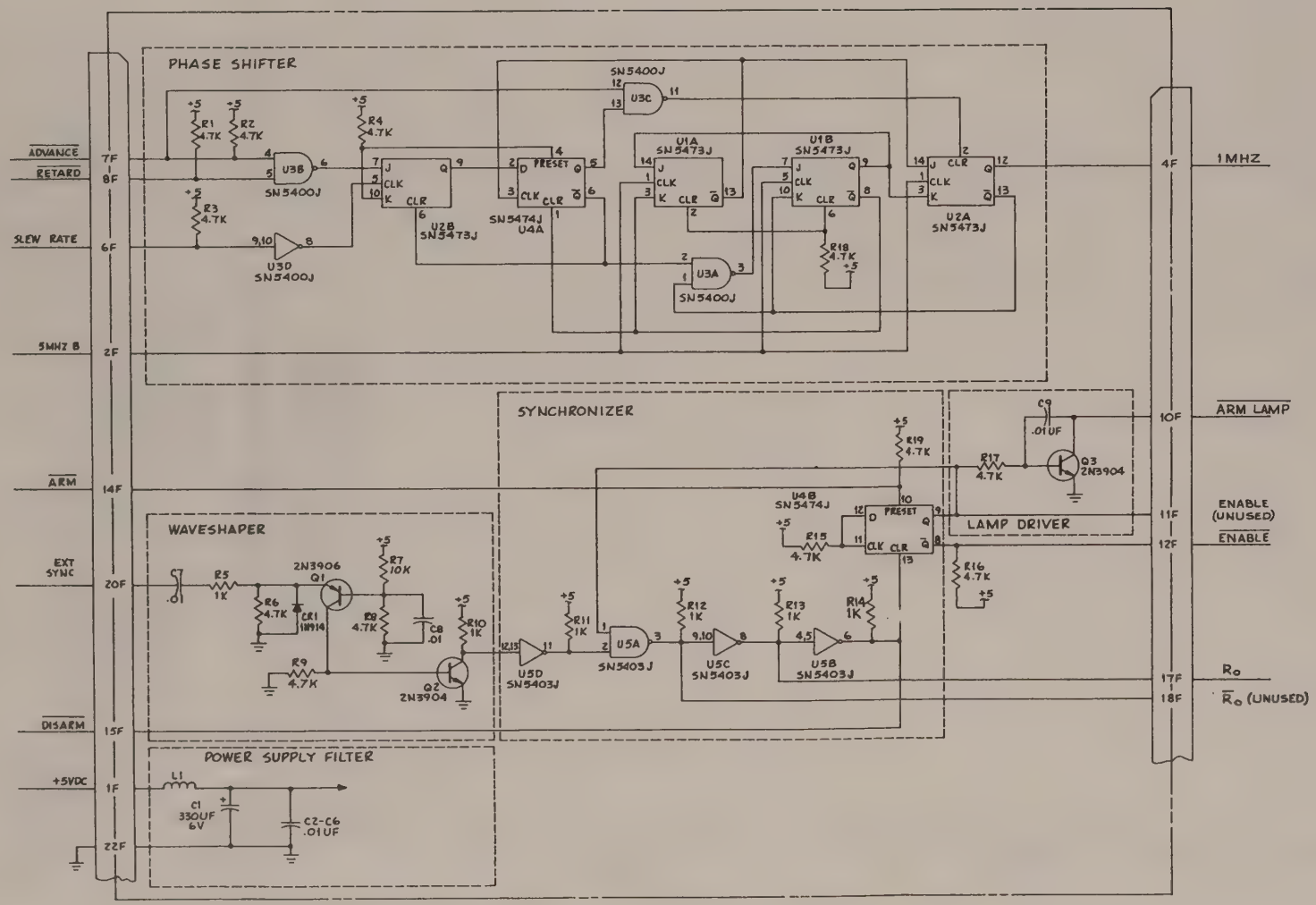
4.7.3 The external signal, EXT SYNC, (used to synchronize the clock to an external source) is first conditioned and converted to TTL levels by the wave shaper circuits that include Q1 and Q2.

4.7.4 The synchronizer circuits consist of U4B and U5. The purpose of these circuits is to generate the R0 signal and the $\overline{\text{ENABLE}}$ whenever U4B-9 has been preset high by $\overline{\text{ARM}}$. R0 is used on the divider card to reset the decade divider chain, thus synchronizing all clock outputs. U5B clears U4B, forcing the clock to be re-armed before another R0 can be generated. Thus, the clock is automatically disarmed when synchronizing from an external source.

4.7.5 The $\overline{\text{ENABLE}}$ signal is used to enable the ADV/RET switch and the SET/RUN switch. DISARM must be manually generated by the ARM/DISARM switch after arming the clock to use either the slewing or clock setting functions.

4.7.6 The lamp driver, Q3, turns on the ARM lamp whenever U4B is in the armed state.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	C	ADDED BORDER & TITLE BLOCK; SHEET SIZE WAS D	2-10-74	



127 96209	1210D	A15	4-16
	1210C	PCB 5	
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR	C.J. BALZER	4-11-73
CHECK		
DRFTSMN	L.D. BECKER	4-11-73

AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC DIAGRAM - TIME SYNC.

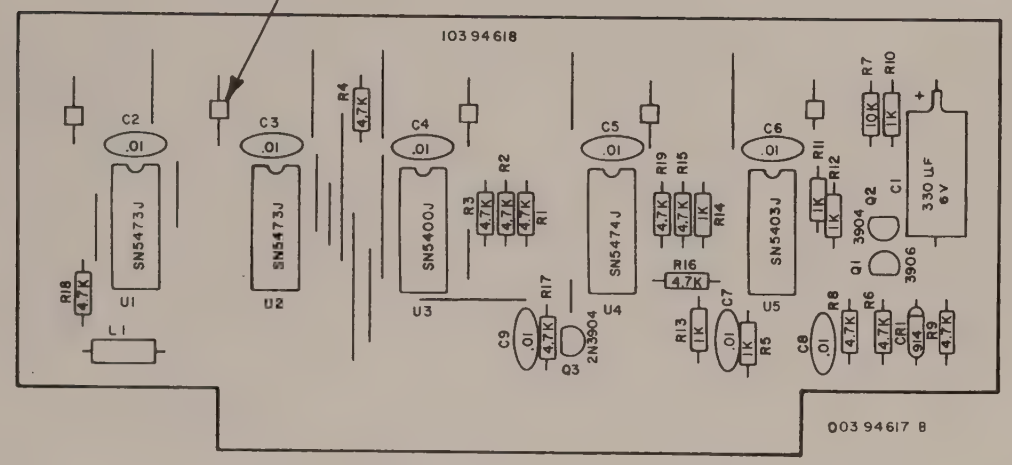
SIZE	CODE IDENT NO		
3	24672	123 94686	C

SCALE N/A | SHEET 1 OF 1

4-8A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	E	REDRAWN TO UPGRADED STDS PER ECO # 2075	10-26-77	RDB
	F	REVISED PARTS LIST PER ECO. 2892	4-16-79	RDB

FERRITE BEAD (TYP)



				TOLERANCES UNLESS OTHERWISE SPECIFIED			AUSTRON INC AUSTIN, TEXAS			
				DEC	FRAC	ANG	PC BOARD ASSY – TIME SYNC.			
				MATERIAL:						
27196208-1	1210D-01	A15	4-17							
27196208	1210D	A15	4-17	ENGR	ISERT	10-26-77	SIZE 2	CODE IDENT NO 24672	103 94618	F
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK	BARKER	10-26-77				
APPLICATION				DRFTMN	PRELLOP	10-25-77	SCALE 1:1		SHEET 1 OF 1	

4-8 B

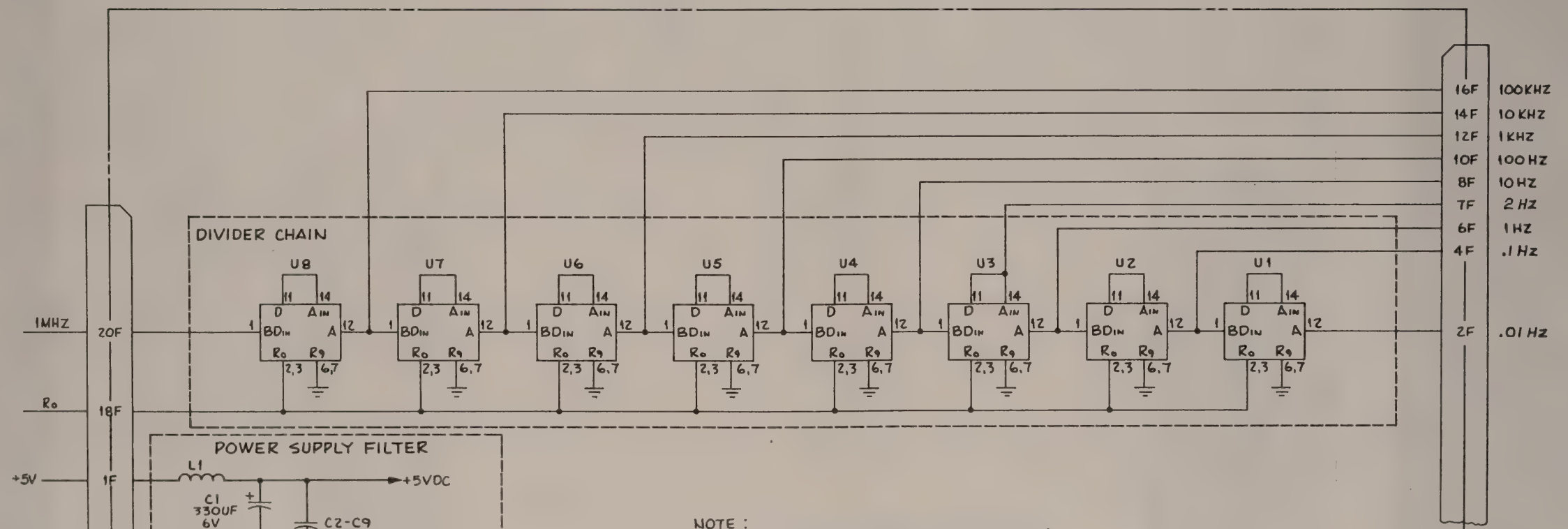
4.8 DIVIDER CARD

4.8.1 The Divider assembly (A14) contains provisions for eight cascade decade dividers.

4.8.2 The 1 MHz TTL output from the Time Sync card is divided to 1 Hz by means of six cascade decade dividers. The resulting 1 Hz and other intermediate rates are used by the Clock Driver and the Phase Shifter cards.

4.8.3 The R0 signal originates on the Time Sync card, and is used to reset all dividers when synchronizing the clock to an external source.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	B	ADDED BORDER & TITLE BLOCK - NO CHANGE	2-10-78	RDB



NOTE :
1. ALL INTEGRATED CIRCUITS ARE SN5490J.
2. INSTALL IC's AS REQUIRED

103 94603	1210D	A14	4-18
	1210C	PCB6	
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	C.J.B.	4-4-73
CHECK		
DRFTMN	L.D.B.	4-4-73

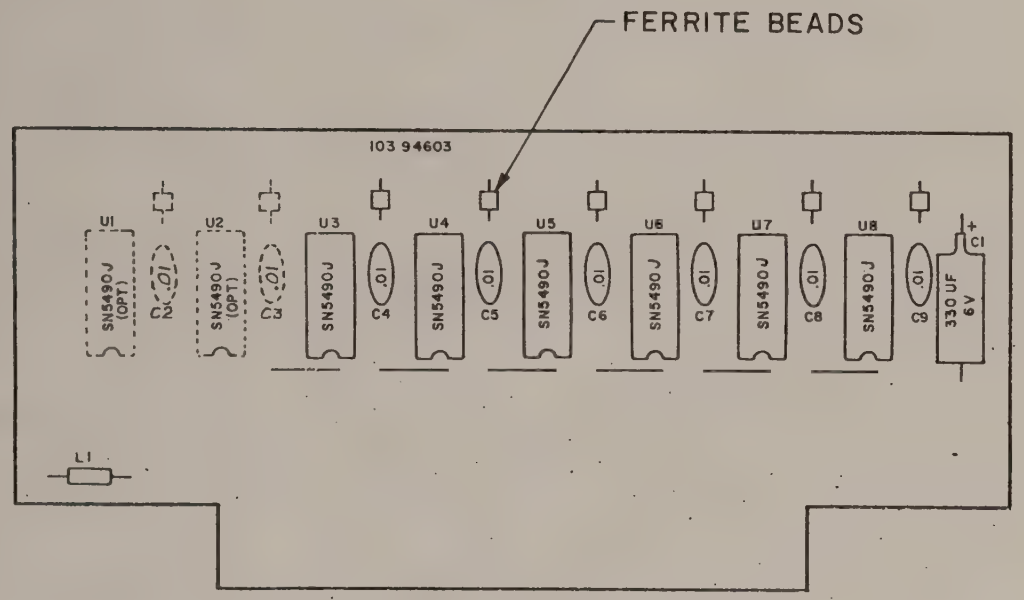
AUSTRON INC
AUSTIN, TEXAS

SCHEMATIC DIAGRAM - DIVIDER

SIZE	CODE IDENT NO		
2	24672	123 94679	B
SCALE N/A		SHEET 1 OF 1	

4-9A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	ECO 974; DELETED SOCKETS; REDRAWN	12/29/75	RDB
	C	DELETED JUMPERS, BEADS, & .01 CAPS (C2 & C3) ASSOCIATED WITH U1 & U2 PER ECO 1465	5-18-76	RDB
	D	ECO 2088: SN 5490J WAS SN5490N	10-7-77	RDB
	E	ADD C2+C3, JUMPERS + TABLE ECO 2274	3-17-78	RDB



	103 94603	C4 THRU C9 AND U3 THRU U8 INSTALLED
*	103 94603-1	C3 AND U2 ADDED
*	103 94603-2	C2 AND C3, U1 AND U2 ADDED

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1		LIST OF MATERIAL			

		271 94537 *	1210 C
A14	4-19	271 96208	1210 D
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

TOLERANCES
UNLESS OTHERWISE SPECIFIED
DEC | FRACT | ANG

MATERIAL:

ENGINEER L.D.H. 12-75
CHECKED
DRAFTSMAN K.L.Wynter 12/29/75

AUSTRON INC AUSTIN TEXAS

PC BOARD ASSY, DIVIDER

SIZE	CODE IDENT NO		
2	24672	103 94603 *	E

SCALE 1/1 SHEET 1 OF 1

4-9B

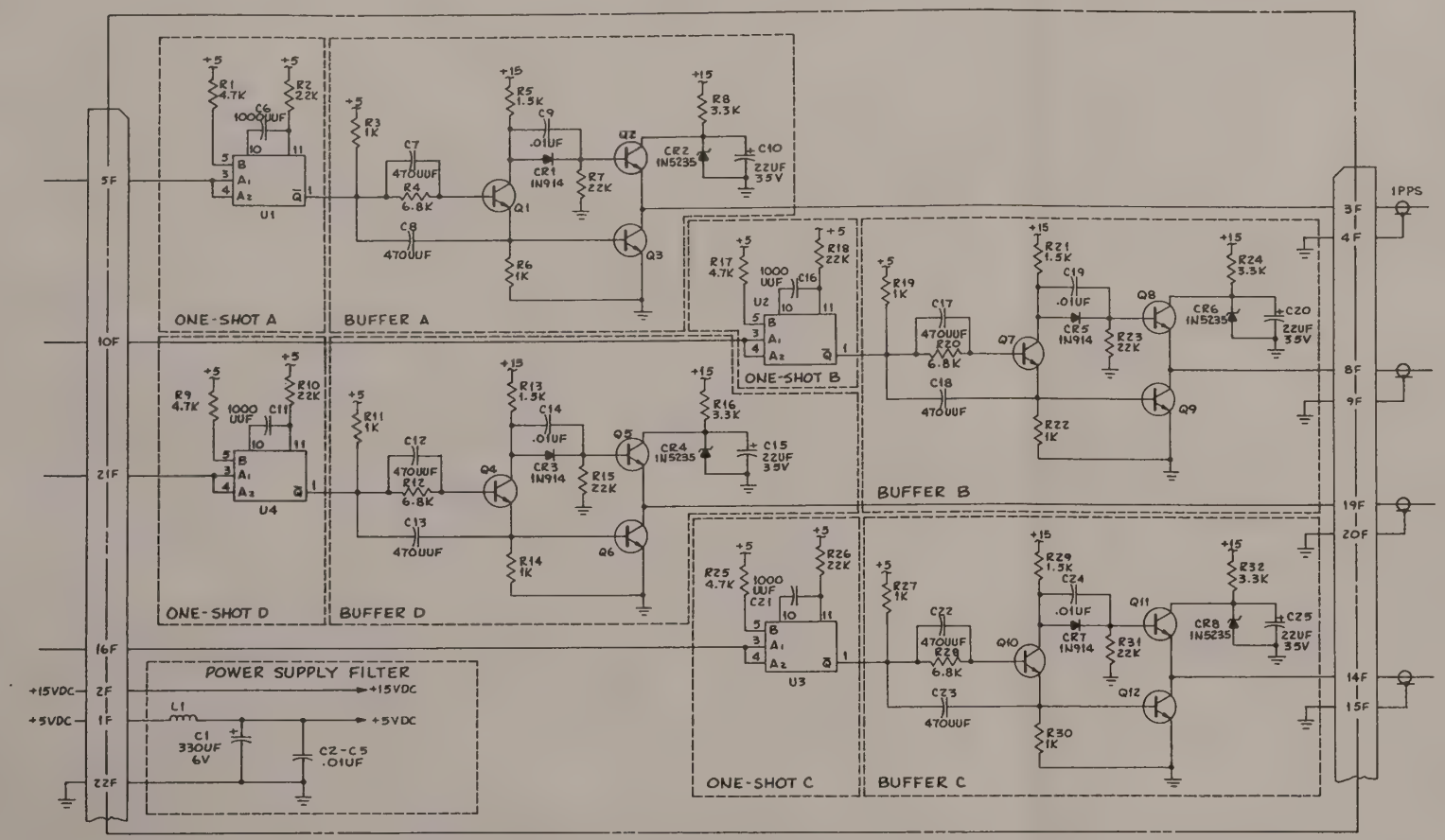
4.9 PULSE AMPLIFIER CARD

4.9.1 The Pulse Amplifier card (A13) contains four identical pulse shapers and line drivers.

4.9.2 U1 is a one-shot multivibrator which accepts a TTL signal from the Divider card. The output of the one-shot is a pulse of fixed duration, determined by R2 and C6. Q1, Q2, and Q3 form a line driver capable of delivering a 5 volt pulse to a 50 ohm load.

4.9.3 Only the required circuits will be connected in order to conserve power. Normally only one circuit will be used for 1 PPS.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD



NOTES:
1. UNLESS OTHERWISE SPECIFIED, ALL TRANSISTORS ARE 2N3904, ALL IC'S ARE SN54121J.

103 94595	1210D	A13	4-20
	1210C	PCB 7	
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR	C.J. BALZER	4-17-73
CHECK		
DRFTSMN	L.D. BECKER	4-17-73

AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC DIAGRAM - PULSE AMPLIFIER

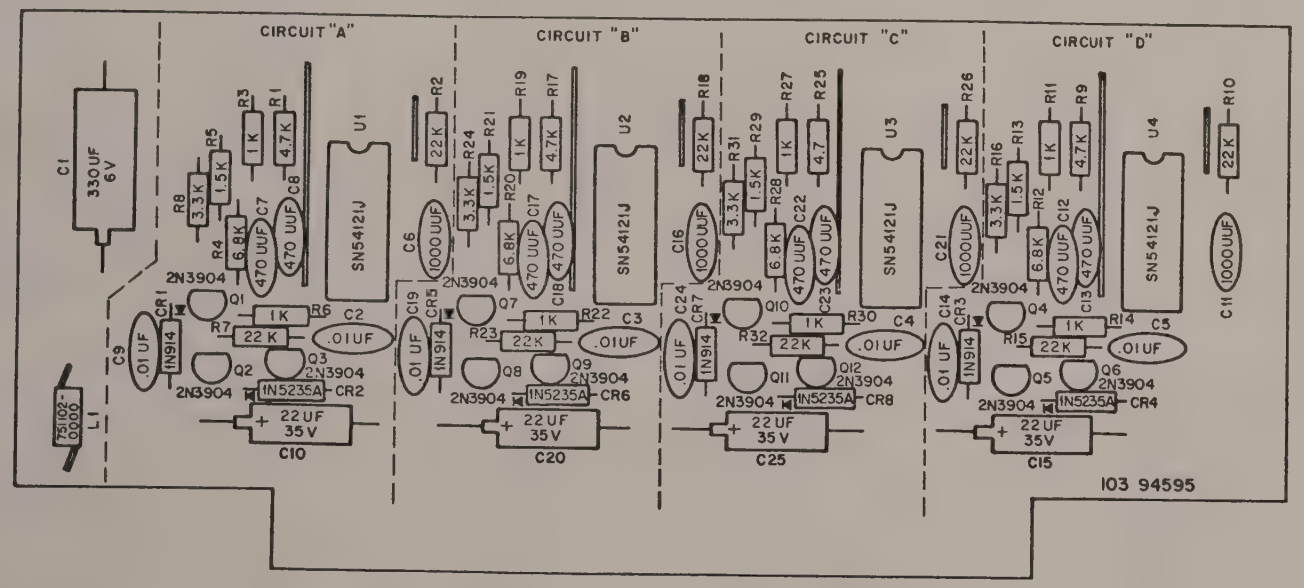
SIZE	CODE IDENT NO		
3	24672	123 94695	A
SCALE N/A		SHEET 1 OF 1	

4-10A

*	FOR PART NO.	USE CIRCUIT
	103 94595	ALL
	103 94595-1	"A"
	103 94595-2	"A" & "B"
	103 94595-3	"A", "B" & "C"

SEE NOTE 2

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REDRAWN TO ADD DASH NOS. PER ECO 1184	12-10-75	RDB
	B	ECO 1192; ADDED NOTE 2	1-6-76	JA
	C	CR2,4,6 & 8 TYPE NO. WAS 1N5235; ECO #1857	3-15-77	RDB
	D	703SN54121J WAS 703SN54121N PER ECO 2090	10-14-77	RDB
	E	REVISED PARTS LIST PER ECO. 2891	4-16-79	RDB



2. NO DASH VERSION USES 703SN74121N INSTEAD OF 703SN54121J.

*1. IDENTIFY ASSEMBLY WITH APPROPRIATE PART NUMBER PER CHART ABOVE.

NOTES:

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1			LIST OF MATERIAL		

A13	4-21	271 96208	1210D
REF DES	FIG NO	NEXT ASSY	USED ON
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWING

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRACT	ANG

MATERIAL:

ENGINEER		
CHECKED		12-10
DRAFTSMAN	BARKER	12-10-75

AUSTRON INC AUSTIN TEXAS

P C BOARD ASSY.-
PULSE AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	103 94595 *	E
SCALE 1:1		SHEET 1 OF 1	

4-10 B

TIME-OF-DAY

4.10 TOD CONTROL AND DISPLAY

4.10.1 The Model 1210D TOD Display, which is composed of assemblies A4, A5 and various controls which are mounted on the front panel, is covered by a single description and schematic.

4.10.2 The model 1210D A4 assembly contains six dividers, U11 through U16, and six decoder/driver/displays, U21 through U26. The A5 assembly contains a quad 2-line to 1-line data selector, U12; a one shot, U23; a flip flop, U22; and various gates.

4.10.3 In the RUN mode, a 1 PPS signal from the clock divider is processed by the sliver generator, composed of A5Q1, A5Q2, and A5U11D, and applied to the A1 input of the data selector, A5U12. The Y1 output of A5U12 drives the units seconds divider, A4U11, which is decoded and displayed by A4U21. The OD output of A4U11 drives the tens of seconds divider A4U12, which is decoded and displayed by A4U22. When a six is present at the outputs of A4U12, it is detected by gate A5U11A which furnishes a pulse to the reset gate A5U11B and to the A2 input of the data selector, A5U12. The Y2 output of A5U12 drives the units minutes and tens of minutes dividers and decoder/displays in similar manner. Gate A5U13A functions like gate A5U11A by furnishing a pulse both to the reset gate A513B and to the A3 input of the data selector, A5U12. The Y3 output of A5U12 drives the units hours divider A4U15, whose output is decoded and displayed by A4U25. The OD output of A4U15 drives the tens of hours divider A4U16 whose output is decoded and displayed by A4U26. The units hours and tens of hours dividers A4U15 & 16, are cascaded together to form a divide by twenty-four stage: the QC output of A4U15 and the QB output of A4U16 are detected by gate A513D and applied to the reset gate A513C, which then reset both A5U15 and A5U16. The A4 input of the data selector A5U12 receives a 1 PPS signal from A5Q2, and the Y4 output drives the 1 SEC lamp A2DS1.

4.10.4 In the SET mode an $\overline{\text{ENABLE}}$ will be present at A2S6A from the clock arm circuit. When switch A2S6A is placed in the SET position (up), the Q output of A5U22A goes high. This is connected to the select input of the data selector A5U12 and selects the B inputs, thereby isolating the seconds, minutes and hours counters. The divider A5U22B receives a 10 PPS signal from the clock divider and divides it by two. The resulting 5 PPS is applied to the one-shot A5U23B, whose time constant is approximately one µsecond. The one µsecond 5 PPS signal is present at gates A5U11C, A5U21D, and A5U21C, which are controlled by switches A2S4, A2S3, and A2S2 respectively. These switches allow the 5 PPS rate to be applied to the seconds, minutes, or hours counter, as selected.

4.10.5 The one-shot A5U23A is used to enable the clock display when an ac signal is present to retrigger the one-shot or when the demand button is pushed during standby operation. The time constant for A5U23A is approximately 8 seconds. Switch A2S6B will turn on display regardless of the state of A5U23A.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	10-10-75	RWB
	A	GENERAL REVISION PER ECO # 1185	12-11-75	RWB
	B	ECO 1275 (1) Q4 WAS 5192 (2) Q3 WAS 3904 (3) R14 WAS 4.7K (4) R15 WAS 47Ω	2-17-76	RWB

A4 103 96186

P1-4,5,6,7 +5V → J1-4,5,6,7
P2-5,6,7,8 GND → J2-5,6,7,8
C1 .01 C2 .01 C3 .01 C4 .01 C5 .01 C6 .01 → +5V

U21 U22 U23 U24 U25 U26 LTH EN
U11 SN54LS90J U12 SN54LS90J U13 SN54LS90J U14 SN54LS90J U15 SN54LS90J U16 SN54LS90J
U11A U11B U11C U13A U13B U13C U13D
U12 SN54LS157 SELECT STROBE
U22A SN54LS74J U22B SN54LS74J
U23A SN54L123J U23B SN54L123J
U21A U21B U21C U21D

J2-1,2,3 P2-1,2,3
P1-14 J1-14 J1-15 P1-15
J1-16 P1-16 J1-13 P1-13 J1-9 P1-9 J2-14 P2-14 J2-13 P2-13 J2-11 P2-11
J2-12 P2-12 J2-9 P2-9

+5V R1 4.7K SET
ENABLE A2S6A
+5V R2 47K RUN
IPPS
+5V R7 4.7K R8 1K Q1 2N3904 R9 47K Q2 2N3904 R5 4.7K R6 4.7K U11D
R10 4.7K
A2DS1 1 SEC R3 330
+5V R12 47K R11 4.7K C1 750 UF CR1 IN914 R13 1K R14 680 Q4 2N5193 R15 68Ω 1/2W 2N3906 Q3
DEMAND A2S1
SET/RUN A2S6B
AC
10PPS
+5V R4 4.7K +5V R16 15K C2 100PF +5V R17 4.7K
+5V R18 4.7K R19 4.7K Q5 2N3904 R20 4.7K R21 4.7K
SEC SET A2S4 MIN SET A2S3 HRS SET A2S2
+5V P1-4,5,6,7 → +5V
GND P2-5,6,7,8
C3 .01 C4 .01 C5 .01 C6 .01 C7 .01

4. LAST REFERENCE DESIGNATOR USED: R21, C7, Q5, DS1, CR1, S6
3. ALL GATES AND INVERTERS ARE SN54LS00J
2. ALL RESISTORS ARE 1/8 W, 10% COMP
1. ALL COMPONENTS ARE PART OF A5 103 96188
NOTES: UNLESS OTHERWISE SPECIFIED

103 96188	1210D	A4/A5	4-22
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED: DECIMALS | FRACTIONS | ANGLES
MATERIAL:

ENGR	L.L. ISERT, JR	10-10-75
CHECK	R. BARKER	10-10-75
DRFTSMN	K. WIGINTON	10-6-75

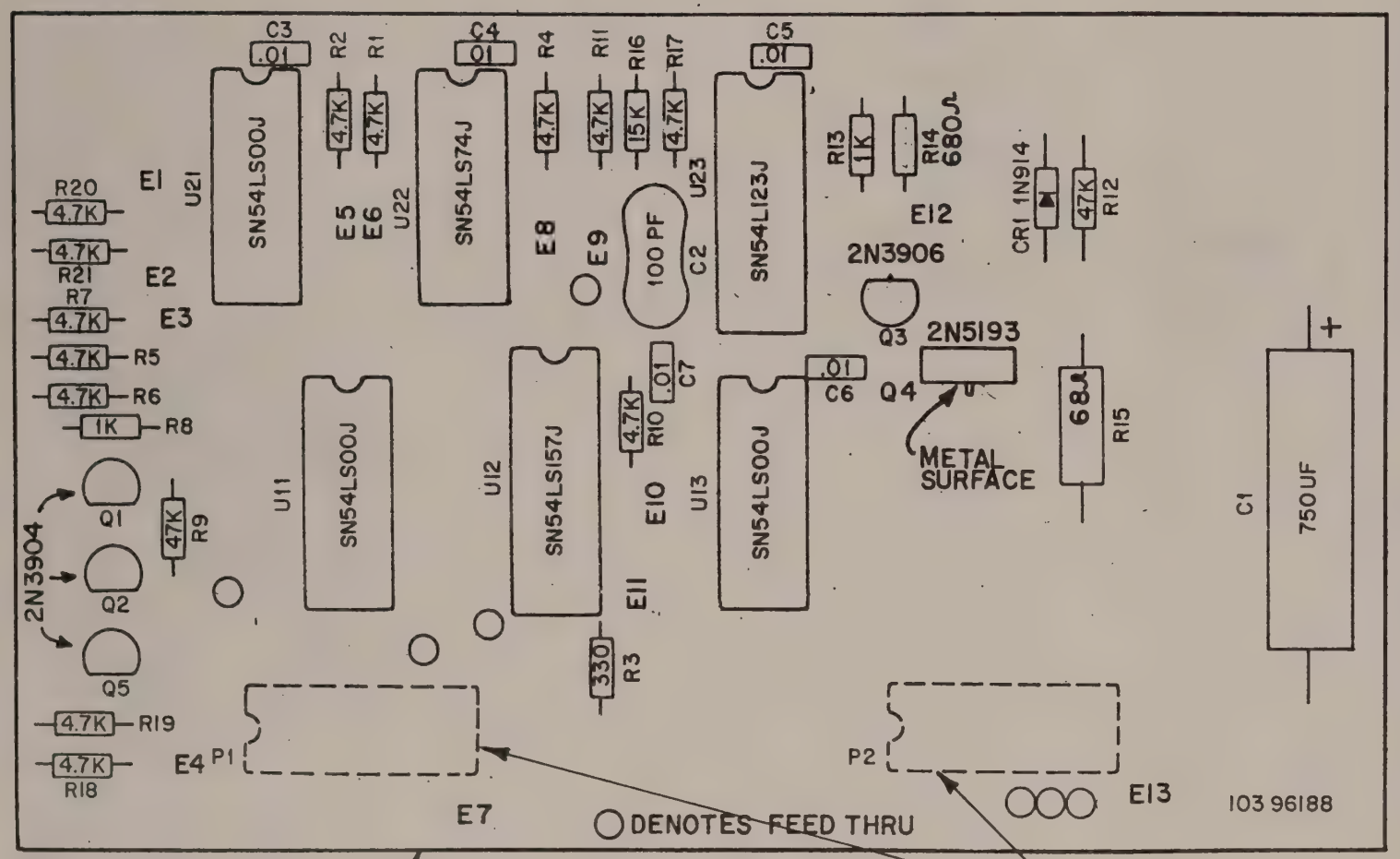
AUSTRON INC. AUSTIN, TEXAS

SCHEMATIC DIAGRAM - TOD CONTROL/TOD DISPLAY

SIZE	CODE IDENT NO		
4	24672	123 96189	B
SCALE N/A		SHEET 1 OF 1	

4-12A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	9-29-75	ROB
	A	REVISED SILKSCREEN PER ECO #1186	12-16-75	ROB
	B	Q3 WAS 3904; Q4 WAS 5192; R14 WAS 4.7K; R15 WAS 47; PER ECO# 1275	2-17-76	ROB
	C	REVISED PARTS LIST PER ECO. 2888	4-16-77	RJD



1. INSTALL IC PLATFORMS ON FAR SIDE OF BOARD.

NOTES:

109 96193	1210D	A5	4-23
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.ISERT	9-29-75
CHECK	R.BARKER	9-29-75
DRFTMN	R.BARKER	9-20-75

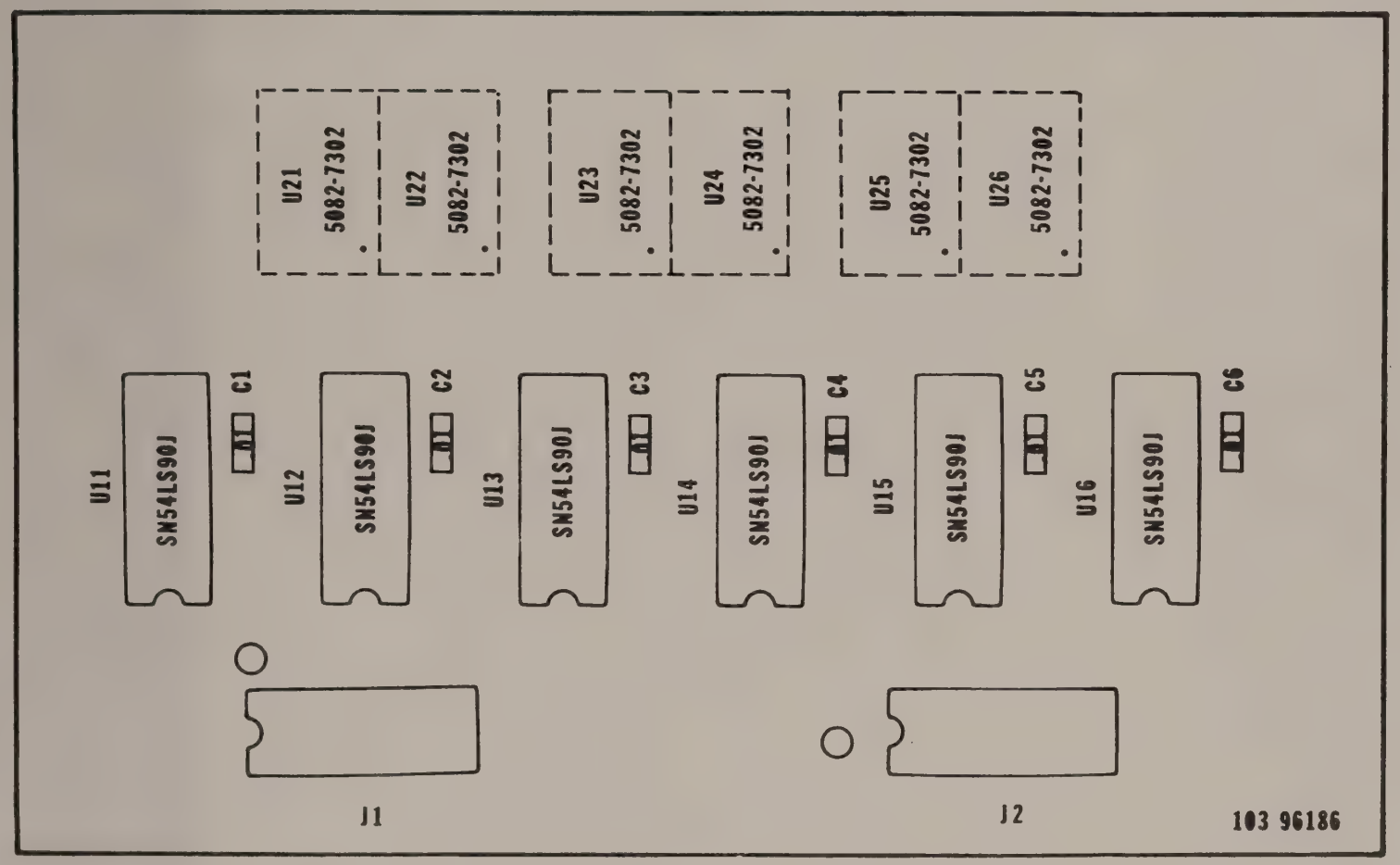
AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY -
TOD CONTROL

SIZE	CODE IDENT NO		
2	24672	103 96188	C
SCALE 2:1		SHEET 1 OF 1	

4-12 B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	9-29-75	RDB
	A	REVISED TITLE BLOCK TO INCLUDE REF DES & FIG NO; SCALE WAS 1:1; PER ECO 2221	2-13-78	RDB
	B	ADD NOTE 2 PER ECO 2310	3-16-78	RDB
	C	REVISED PARTS LIST PER ECO. 2887	4-16-79	RDB



109 96193	1210D	A4	4-24
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR	L.L.I., JR.	9-29-75
CHECK	R.D.B.	9-29-75
DRFTMN	BARKER	9-20-75

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY -
TOD DISPLAY

SIZE	CODE IDENT NO		
2	24672	103 96186	C
SCALE 2:1		SHEET 1 OF 1	

4-12 C

4.11 INTERNAL OSCILLATOR

4.11.1 The AUSTRON Sulzer Model 1150 oscillator (A9) employs a high quality 5 MHz, fifth-overtone, high-temperature bake-out crystal unit which exhibits exceptional retrace and long-term aging characteristics. The crystal is mounted in another proportionally controlled oven. This arrangement assures almost complete freedom from frequency shifts due to environmental temperature changes. A high-gain AGC system is used to keep the crystal drive level constant, assuring excellent long-term aging.

NOTE: The AUSTRON Model 1150 is a sealed unit, and as such, is not field repairable. If this assembly is found to be in need of repair, return it to AUSTRON, Inc. (see section 6.0).

5.0 MAINTENANCE

5.1 SCOPE OF SECTION

5.1.1 This maintenance section of this manual provides the technician with a general approach to maintaining the model 1210D. Included are trouble analysis guides and general maintenance procedures.

5.2 TROUBLE ANALYSIS GUIDES

5.2.1 Specific information is provided in the following:

	SYMPTOM	PROBABLE CAUSE
1)	(PWR Lamp) 1A2DS3 fails to light.	1. AC power not available. 2. Power switch not ON. 3. Power cord not connected. 4. 230 V selected when using 115 V. 5. Lamp is burned out.
2)	Charge lamp fails to light (1A2DS4) when line lamp is on.	1. Lamp burned out. 2. Switch 1A2S11 open.
3)	BATT circuit test reads high.	1. Blown 1A10F2. 2. Open 1A2S10. 3. Battery pack open.
4)	OVEN circuit test reads low.	1. Oscillator is in warm-up stage. 2. Supply voltage to oscillator is low. 3. Defective oscillator.
5)	RF circuit test reads low.	1. Check output of oscillator; should be 1 V RMS, unloaded.

5.2.1 (Cont'd.)

	SYMPTOM	PROBABLE CAUSE
6)	All meter functions not correct.	1. Bad power supplies. 2. Meter 1A2M1 is bad. 3. Switch 1A2S5 is bad.
7)	ARM lamp will not light after placing switch 1A2S7 in the ARM (up) position.	1. Switch 1A2S7 is bad. 2. ARM lamp 1A2DS2 is burned out. 3. Logic on TIME SYNC pcb (A15) not functional.
8)	Cannot set TOD display.	1. Clock is not ARMed. 2. ARM circuit not functional. 3. SET/RUN switch (1A2S6) not in SET position. 4. 10 PPS input not present on TOD gating circuitry (A5). 5) TOD control pcb/(A5) not functional.
9)	1 SEC lamp (1A2DS1) does not flash each second.	1) SET/RUN switch (1A2S6) not put into RUN position while clock was ARMed. 2) Lamp (1A2DS1) is burned out. 3) 1 PPS not available from clock logic.
10)	TOD display not incrementing time.	1) Display not functioning because ac not prsent. Press DEMAND pushbutton. 2) 1 PPS from clock logic not available. 3) Clock not placed in the RUN mode with the clock ARMed. 4) TOD CONTROL pcb not functional. 5) Divider on TOD DISPLAY pcb not functional.

5.2.1 (Cont'd.)

	SYMPTOM	PROBABLE CAUSE
11)	Clock output cannot be slewed.	1. Clock not ARMed. 2. Slew rates not available from divider chain. 3. Switch 1A2S9 open. 4. Switch 1A2S8 open. 5. TIME SYNC pcb (A15) not functional.
12)	Clock will not sync.	1. Clock not ARMed. 2. External SYNC pulse not available. at connector 1A2J1. 3. TIME SYNC pcb (A15) not functional.
13)	Sine Wave output not present.	1. Check associated buffer card. 2. Check associated output filter.
14)	Pulse output not present.	1. Check PULSE AMPLIFIER pcb. 2. Check DIVIDER pcb.
15)	No clock outputs are functional.	1. OSC switched to EXT. STD. input. 2. Power supply is bad.
16)	Cannot adjust coarse frequency.	1. Tuning tool broken. 2. Defective oscillator.
17)	Batteries will not operate unit for 8 hours.	1. Not charged for 16 hours. 2. High charging circuit not delivering 500 to 750 mA. 3. Replace batteries.

5.3 GENERAL MAINTENANCE

5.3.1 Check capacity of Nicad batteries every six months. Deep discharge and recharge for 16 hours. When batteries do not give required standby capacity replace them. (See paragraph 1.3.1.2.)

5.3.2 No other periodic maintenance is required.

6.0 REPLACEABLE PARTS

6.1 SCOPE OF SECTION

6.1.1 The following is a list of replaceable parts which includes the reference designator, description, and AUSTRON Part Number. For convenience in ordering from local suppliers, the manufacturer's part number and the manufacturer's Federal Identification Code (FIC) are also given where applicable.

6.2 ORDERING REPLACEMENT PARTS

6.2.1 To order replacement parts from AUSTRON, Inc. address order to:

AUSTRON, Inc.
1915 Kramer Lane
Austin, Texas 78758

Specify for each part; 1)model and serial number of the instrument from the rear panel label, 2)complete circuit reference designator, 3)AUSTRON part number, 4)description.

6.2.2 To order parts not listed, add a complete description of function of part and location.

6.2.3 Part numbers as shown will change occasionally as vendor items are re-evaluated or as improved components become available. The equivalent part currently used in production at the time orders are received will be shipped. Where manufacturer's part number or FIC is missing, any reputable manufacturer's part of the appropriate value, indicated in the description, may be used.

6.2.4 The circuit reference designator includes the reference designator prefix in the page heading plus the reference designator for the individual part. If, for example, the reference designator prefix for a circuit board assembly is 1A4A7 and the desired componenet is capacitor C1, the complete circuit reference designator would be 1A4A7C1.

ASSEMBLY CRYSTAL CLOCK, MODEL 1210D
ASSEMBLY NUMBER 32196206
REFERENCE DESIGNATOR PREFIX
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	PCB ASSY, EXTENDER	10393765		24672
	MANUAL	12796207		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONN MS-TYPE 3-PIN FEMALE	551106-0017	MS3106A-14S-1S	74861
	TUNING WAND	901000-8605	8605	20018
1	FINAL ASSY, MODEL 1210D	27196208		24672

ASSEMBLY FINAL ASSY, MODEL 1210D
ASSEMBLY NUMBER 27196208
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	NOT USED			
A2	PANEL ASSY, FRONT	10996193		24672
A3	PCB ASSY, OUTPUT FILTER	10396735		24672
A4	PCB ASSY, TOD DISPLAY	10396186		24672
A5	PCB ASSY TOD CONTROL	10396188		24672
A6	PLATE ASSY	11096211		24672
A7	PCB ASSY, BRIDGE	10394664		24672
A8	BATTERY PACK ASSY	12096212		24672
A9	XTLOSC, 1150 (70-85 DEG)	30296818		24672
A10	PANEL ASSY, REAR	10996195		24672
A11	PCB ASSY, DC FILTER	10396200		24672
A12	PCB ASSY, INTERCONNECT	10396769		24672
A13	PCB ASSY, PULSE AMPLIFIER	10394595-1		24672
A14	PCB ASSY DIVIDER	10396614		24672
A15	PCB ASSY, TIME SYNC	10394618		24672
A16	PC BOARD ASSY T5VDC REGULATOR	10394607		24672
A17	PCB ASSY, +15 VDC REGULATOR	10396197		24672
A18	PCB ASSY, SINE CONVERTER	10396025-1		24672
A19	PCB ASSY, OUTPUT AMPLIFIER	10396031-1		24672
MP1	COVER, FRONT	00794304		24672
MP2	COVER INSTRUMENT	00796209-1		24672
MP3	COVER INSTRUMENT	00796209-2		24672
MP4	BAR RECTANGULAR	01096753		24672
MP5	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP6	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP7	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP8	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP9	WASHER, PRELOAD	02096741		24672
MP10	WASHER, PRELOAD	02096741		24672
MP11	WASHER, PRELOAD	02096741		24672
MP12	WASHER, PRELOAD	02096741		24672
MP14	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP15	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519

ASSEMBLY FINAL ASSY, MODEL 1210D (CONT)
ASSEMBLY NUMBER 27196208
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
MP16	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP17	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP18	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP19	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP20	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP21	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP22	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP23	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP24	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP25	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330

ASSEMBLY PANEL ASSY, FRONT
ASSEMBLY NUMBER 10996193
REFERENCE DESIGNATOR PREFIX 1A2
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
DS1	1.2 MCD 20MA T1 3/4 LED RED	555600-4403	5082-4403	28480
DS2	LAMP, RED 28V	555008-0002	BP62-RCB-1762	03797
DS3	LAMP, GRN 28V	555008-0004	BP62-GCB-1762	03797
DS4	LAMP, YEL 28V	555008-0005	BP62-ACB-1762	03797
J1	CONNECTOR BNC	551100-7935	KC79-35	11636
J2	CONNECTOR BNC	551100-7935	KC79-35	11636
J3	CONNECTOR BNC	551100-7935	KC79-35	11636
J4	CONNECTOR BNC	551100-7935	KC79-35	11636
J5	CONNECTOR BNC	551100-7935	KC79-35	11636
S1	SWITCH PSHBTN SPST N.O.	553012-0001	30-1	81073
S2	SWITCH PSHBTN SPST N.O.	553012-0001	30-1	81073
S3	SWITCH PSHBTN SPST N.O.	553012-0001	30-1	81073
S4	SWITCH PSHBTN SPST N.O.	553012-0001	30-1	81073
S5	SWITCH, ROTARY	553905-3601	50CD3601-2-AJN	81073
S6	SWITCH TOGGLE DPDT	553010-0006	MST205N	95146
S7	SWITCH, TOGGLE, SPDT CENTER OFF	553304-0006	7105	09353
S8	SWITCH, TOGGLE, SPDT CENTER OFF	553304-0006	7105	09353
S9	SWITCH, ROTARY	553905-3601	50CD3601-2-AJN	81073
S10	SWITCH TOGGLE DPDT	553010-0006	MST205N	95146
S11	SWITCH TOGGLE DPDT	553010-0006	MST205N	95146
M1	METER, 0-100UA	557000-0020	1S-DUA-100	32171
MP1	FILTER POLAROID	02096755		24672
MP2	DIAL KNOB TURNS COUNTING	505010-0462	RD462	75042
R1	10 K 2 W 5 RES VAR W.W.	659275-0103	534-103	02111

ASSEMBLY PCB ASSY, OUTPUT FILTER
ASSEMBLY NUMBER 10396735
REFERENCE DESIGNATOR PREFIX 1A3
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C2	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C3	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
L1	5MHZ CHOKE	75196737		24672
L2	1MHZ CHOKE	75196736		24672
L3	1MHZ CHOKE	75196736		24672

ASSEMBLY PCB ASSY, TOD DISPLAY
ASSEMBLY NUMBER 10396186
REFERENCE DESIGNATOR PREFIX 1A4
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C2	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C3	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C4	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C5	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C6	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
U11	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U12	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U13	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U14	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U15	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U16	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U21	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
U22	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
U23	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
U24	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
U25	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
U26	LED NUM. DISPLAY 0.3IN LHDP W/LATCH	555600-7302	5082-7302	28480
X1	SOCKET, I.C. 16-PIN	551026-0860	1-380860-1	04618
X2	SOCKET, I.C. 16-PIN	551026-0860	1-380860-1	04618

ASSEMBLY PCB ASSY TOD CONTROL
ASSEMBLY NUMBER 10396188
REFERENCE DESIGNATOR PREFIX 1A5
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	750 UF 25V 10 CAP TANT	608016-0757	69F2436G2	01002
C2	100 PF 500V 5 CAP DIP MICA	603000-0101	DM15-101J	02799
C3	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C4	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C5	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C6	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
C7	.01 UF 50 V 20 CAP CERAMIC	601100-0103	CY15C103M	71590
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
P1	PLATFORM 16 DIP	551016-0013	616-AG1	91506
P2	PLATFORM 16 DIP	551016-0013	616-AG1	91506
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q4	40 W CASE 77-1 XSTR PNPS AP	7022N5193	2N5193	81349
Q5	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R2	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R3	330 OHM 1/8W 10 RES FXD COMP	651110-0331	RC05GF331K	81349
R4	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R5	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R6	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R7	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R8	1 K 1/8W 10 RES FXD COMP	651110-0102	RC05GF102K	81349
R9	47 K 1/8W 10 RES FXD COMP	651110-0473	RC05GF473K	81349
R10	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R11	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R12	47 K 1/8W 10 RES FXD COMP	651110-0473	RC05GF473K	81349
R13	1 K 1/8W 10 RES FXD COMP	651110-0102	RC05GF102K	81349
R14	680 OHM 1/8W 10 RES FXD COMP	651110-0681	RC05GF681K	81349
R15	68 OHM 1/2W 05 RES FXD COMP	651101-0680	RC20GF680J	81349
R16	15 K 1/8W 10 RES FXD COMP	651110-0153	RC05GF153K	81349
R17	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R18	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349

ASSEMBLY PCB ASSY TOD CONTROL (CONT)
ASSEMBLY NUMBER 10396188
REFERENCE DESIGNATOR PREFIX 1A5
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R19	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R20	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
R21	4.7 K 1/8W 10 RES FXD COMP	651110-0472	RC05GF472K	81349
U11	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U12	IC QUADR 2 TO 1 LINE DATA SEL/MUX	703SN54LS157	SN54LS157J	01295
U13	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U21	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U22	IC DUAL D-TYPE FLIP-FLOP	703SN54LS74J	SN54LS74J	01295
U23	IC DUAL RETRIG MONO MVB W/CLEAR	703SN54L123J	SN54L123J	01295

ASSEMBLY PLATE ASSY
ASSEMBLY NUMBER 11096211
REFERENCE DESIGNATOR PREFIX 1A6
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	2600UF 50V 10 CAP ELEC	602036-0268	36D262G050AB2A	56289
CR1	500VR 12A DIO S RECT DO-4	701MR1125	MR1125	04713
CR2	500VR 12A DIO S RECT DO-4	701MR1125	MR1125	04713
CR3	DIODE HOT CARRIER	7011N5829	1N5829	04713
J1	CONNECTOR 5 PIN W/ LOCK CLIP	551300-0007	126-216	13511
Q1	TRANSISTOR	702MJE3055	MJE3055	04713
R1	20 OHM 10 W 3 RES FXD W.W.	652011-0200	RE65G20R0	81349
R2	200 OHM 10 W 3 RES FXD W.W.	652011-0201	RE65G200R	81349
T1	TRANSFORMER ASSY, POWER	12097247		24672
XT1	SOCKET OCTAL	551024-0013	77-MIP8	74868

ASSEMBLY PCB ASSY, BRIDGE
ASSEMBLY NUMBER 10394664
REFERENCE DESIGNATOR PREFIX 1A7
QUANTITY 1 EA

REF DES	PART DESCRIPTION		AUSTRON PART	MFG PART	FIC
CR1	100VR 5A	DIO S RECT	701A15A	A15A	03508
CR2	100VR 5A	DIO S RECT	701A15A	A15A	03508
CR3	100VR 5A	DIO S RECT	701A15A	A15A	03508
CR4	100VR 5A	DIO S RECT	701A15A	A15A	03508

ASSEMBLY BATTERY PACK ASSY
ASSEMBLY NUMBER 12096212
REFERENCE DESIGNATOR PREFIX 1A8
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
BT1	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT2	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT3	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT4	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT5	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT6	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT7	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT8	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT9	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT10	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT11	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
BT12	BATTERY, NICAD 1.25V 7.5AMP.HR.	570900-0015	7.0SCL	31741
MP1	COVER BATTERY, BOTTOM	00796732		24672
MP2	COVER BATTERY, TOP	00796733		24672
MP3	SPACER BATTERY BOX	01596217		24672
MP4	SPACER BATTERY BOX	01596217		24672
MP5	INSULATOR, BATTERY, WIDE	02096215		24672
MP6	INSULATOR, BATTERY, WIDE	02096215		24672
MP7	INSULATOR, BATTERY, NARROW	02096216		24672
MP8	INSULATOR, BATTERY, NARROW	02096216		24672
MP9	INSULATOR, BATTERY, NARROW	02096216		24672
MP10	INSULATOR, BATTERY, NARROW	02096216		24672
P1	CONN, 5 PIN	551300-0013	126-223	74868

ASSEMBLY XTLOSC, 1150 (70-85 DEG)
ASSEMBLY NUMBER 30296818
REFERENCE DESIGNATOR PREFIX 1A9
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	THIS OSCILLATOR IS A SEALED UNIT RETURN TO FACTORY FOR REPAIR			

ASSEMBLY PANEL ASSY, REAR
ASSEMBLY NUMBER 10996195
REFERENCE DESIGNATOR PREFIX 1A10
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
F1	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
F2	FUSE 3AG 1 AMP 250V SLO BLO	552002-0010	313001	75915
F3	FUSE 3AG 2.5 AMP 125V SLO BLO	552001-0026	31302.5	75915
J1	CONN MS-TYPE 3-PIN MALE	551102-0016	MS3102A-14S-1P	74868
J2	CONNECTOR BNC	551100-7935	KC79-35	11636
S1	SWITCH TOGGLE SPDT (C&K #7101)	553010-0015	U11SYZQ	95146
W1	CORD POWER BELDEN 17239-S	570075-0002	17239B	70903
XF1	HOLDER,FUSE	507003-2012	342012	75915
XF2	HOLDER,FUSE	507003-2012	342012	75915
XF3	HOLDER,FUSE	507003-2012	342012	75915

ASSEMBLY PCB ASSY, DC FILTER
ASSEMBLY NUMBER 10396200
REFERENCE DESIGNATOR PREFIX 1A11
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	4.7 UF 35V 10 CAP TANT	608017-0475	CS13BF475K	81349
C2	4.7 UF 35V 10 CAP TANT	608017-0475	CS13BF475K	81349
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
L2	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114

ASSEMBLY PCB ASSY, INTERCONNECT
ASSEMBLY NUMBER 10396769
REFERENCE DESIGNATOR PREFIX 1A12
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.1UF 200V 10 CAP MYLAR	604192-0027	192P10492	56289
C2	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R2	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R3	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R4	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R5	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R6	301 K 1/8W 1 RES FXD FILM	653001-3013	RN55D3013F	81349
R7	10 OHM 1/4W 10 RES FXD COMP	651102-0100	RC07GF100K	81349
R8	10 OHM 1/4W 10 RES FXD COMP	651102-0100	RC07GF100K	81349
R9	10 OHM 1/4W 10 RES FXD COMP	651102-0100	RC07GF100K	81349
R10	10 OHM 1/4W 10 RES FXD COMP	651102-0100	RC07GF100K	81349
R11	56 OHM 1/4W 10 RES FXD COMP	651102-0560	RC07GF560K	81349
XA13	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA14	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA15	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA16	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA17	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA18	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA19	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA20	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769
XA21	CONN 22PIN DUAL READOUT PC TAB	551009-0008	00-6007-044-451-0018	11769

MANUAL PARTS LIST MODEL 1210D

19 NOV 79

ASSEMBLY PCB ASSY, PULSE AMPLIFIER
ASSEMBLY NUMBER 10394595
REFERENCE DESIGNATOR PREFIX 1A13
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
C2	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C3	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C4	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C5	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C6	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C7	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C8	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C9	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C10	22 UF 35V 10 CAP TANT	608017-0226	CS13BF226K	81349
C11	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C12	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C13	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C14	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C15	22 UF 35V 10 CAP TANT	608017-0226	CS13BF226K	81349
C16	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C17	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C18	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C19	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C20	22 UF 35V 10 CAP TANT	608017-0226	CS13BF226K	81349
C21	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C22	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C23	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C24	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C25	22 UF 35V 10 CAP TANT	608017-0226	CS13BF226K	81349
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
CR2	6.8V 500MW 10 DIO S ZEN DO-7	7011N5235A	1N5235A	08288
CR3	PRV75 DIO S SIG	7011N914	1N914	81349
CR4	6.8V 500MW 10 DIO S ZEN DO-7	7011N5235A	1N5235A	08288
CR5	PRV75 DIO S SIG	7011N914	1N914	81349
CR6	6.8V 500MW 10 DIO S ZEN DO-7	7011N5235A	1N5235A	08288
CR7	PRV75 DIO S SIG	7011N914	1N914	81349
CR8	6.8V 500MW 10 DIO S ZEN DO-7	7011N5235A	1N5235A	08288

ASSEMBLY PCB ASSY, PULSE AMPLIFIER (CONT)
ASSEMBLY NUMBER 10394595
REFERENCE DESIGNATOR PREFIX 1A13
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q4	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q5	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q6	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q7	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q8	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q9	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q10	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q11	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q12	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R2	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R3	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R4	6.8 K 1/4W 10 RES FXD COMP	651102-0682	RC07GF682K	81349
R5	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R6	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R7	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R8	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R9	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R10	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R11	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R12	6.8 K 1/4W 10 RES FXD COMP	651102-0682	RC07GF682K	81349
R13	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R14	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R15	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R16	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R17	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R18	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R19	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R20	6.8 K 1/4W 10 RES FXD COMP	651102-0682	RC07GF682K	81349

ASSEMBLY PCB ASSY, PULSE AMPLIFIER (CONT)
ASSEMBLY NUMBER 10394595
REFERENCE DESIGNATOR PREFIX 1A13
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R21	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R22	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R23	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R24	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R25	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R26	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R27	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R28	6.8 K 1/4W 10 RES FXD COMP	651102-0682	RC07GF682K	81349
R29	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R30	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R31	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R32	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
U1	IC MONOSTABLE MULTIVIBRATOR	703SN54121J	SN54121J	01295
U2	IC MONOSTABLE MULTIVIBRATOR	703SN54121J	SN54121J	01295
U3	IC MONOSTABLE MULTIVIBRATOR	703SN54121J	SN54121J	01295
U4	IC MONOSTABLE MULTIVIBRATOR	703SN54121J	SN54121J	01295

ASSEMBLY PCB ASSY, DIVIDER
ASSEMBLY NUMBER 10396614-1
REFERENCE DESIGNATOR PREFIX 1A14
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
C2	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C3	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C4	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C5	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
U1	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U2	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U3	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U4	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U5	IC DIVIDE BY TWELVE COUNTER	703SN54LS92J	SN54LS92J	01295

ASSEMBLY PCB ASSY, TIME SYNC
ASSEMBLY NUMBER 10394618
REFERENCE DESIGNATOR PREFIX 1A15
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
C2	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C3	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C4	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C5	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C6	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C7	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C8	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C9	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
Q1	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R2	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R3	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R4	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R5	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R6	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R7	10 K 1/4W 10 RES FXD COMP	651102-0103	RC07GF103K	81349
R8	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R9	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R10	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R11	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R12	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R13	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R14	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R15	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R16	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R17	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R18	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R19	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349

ASSEMBLY PCB ASSY, TIME SYNC (CONT)
ASSEMBLY NUMBER 10394618
REFERENCE DESIGNATOR PREFIX 1A15
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
U1	IC DUAL J-K FLIP-FLOP W/CLEAR	703SN5473J	SN5473J	01295
U2	IC DUAL J-K FLIP-FLOP W/CLEAR	703SN5473J	SN5473J	01295
U3	IC QUADR 2-INP NAND GATE	703SN5400J	SN5400J	01295
U4	IC DUAL D-TYPE FLIP-FLOP	703SN5474J	SN5474J	01295
U5	IC QUADR 2-INP NAND GATE W/OCOLL OT	703SN5403J	SN5403J	01295

ASSEMBLY PC BOARD ASSY T5VDC REGULATOR
ASSEMBLY NUMBER 10394607
REFERENCE DESIGNATOR PREFIX 1A16
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	100 UF 20V 10 CAP TANT	608016-0107	CS13BE107K	81349
C2	.01 UF 100V 20 CAP CERAMIC	601004-0103	TG-S10	56289
C3	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
CR1	5.6V 1 W 10 DIO S ZEN 59	7011N4734	1N4734	08288
CR2	PRV75 DIO S SIG	7011N914	1N914	81349
CR3	OBSOLETE - SEE 701MR830	701MR840	00000000000000000000	
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
L2	TRANSFORMER	751310-2103	TM-2103	
Q1	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q4	40 W CASE 77-1 XSTR NPNS AP	7022N5192	2N5192	81349
R1	2.2 K 1/4W 10 RES FXD COMP	651102-0222	RC07GF222K	81349
R2	SELECTED 1/4W 10 RES FXD COMP	651102-SEL		
R3	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R4	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R5	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R6	1 K 1/2W 10 RES FXD COMP	651103-0102	RC20GF102K	81349
R7	680 OHM 1/4W 10 RES FXD COMP	651102-0681	RC07GF681K	81349
R8	10 OHM 1/4W 10 RES FXD COMP	651102-0100	RC07GF100K	81349
R9	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349

ASSEMBLY PCB ASSY, +15 VDC REGULATOR
ASSEMBLY NUMBER 10396197
REFERENCE DESIGNATOR PREFIX 1A17
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	100 UF 50V 10 CAP ELEC MIN	602039-0035	39D107G050EJ4	56289
C2	100 UF 50V 10 CAP ELEC MIN	602039-0035	39D107G050EJ4	56289
C3	100 UF 50V 10 CAP ELEC MIN	602039-0035	39D107G050EJ4	56289
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
Q1	TRANSISTOR DUAL	702MD8002	MD8002	04713
Q2	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
R1	5.6 K 1/4W 10 RES FXD COMP	651102-0562	RC07GF562K	81349
R2	12 K 1/4W 10 RES FXD COMP	651102-0123	RC07GF123K	81349
R3	5.6 K 1/4W 10 RES FXD COMP	651102-0562	RC07GF562K	81349
R4	560 OHM 1/4W 10 RES FXD COMP	651102-0561	RC07GF561K	81349
R5	56 OHM 1/4W 10 RES FXD COMP	651102-0560	RC07GF560K	81349
R6	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R7	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R8	1 K 3/4W 10 RES VAR CERMET	659013-0102	89PR1K	06110
R9	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
VR1	5.1V 1 W 10 DIO S ZEN 59	7011N4733	1N4733	08288

ASSEMBLY PCB ASSY, SINE CONVERTER
ASSEMBLY NUMBER 10396025-1
REFERENCE DESIGNATOR PREFIX 1A18
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C2	33 UF 6V 10 CAP TANT	608014-0336	CS13BC336K	81349
C3	NOT USED			
C4	33 UF 6V 10 CAP TANT	608014-0336	CS13BC336K	81349
C5	NOT USED			
C6	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C7	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C8	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C9	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R2	10 K 1/4W 10 RES FXD COMP	651102-0103	RC07GF103K	81349
R3	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R4	10 K 1/4W 10 RES FXD COMP	651102-0103	RC07GF103K	81349
R5	2.2 K 1/4W 10 RES FXD COMP	651102-0222	RC07GF222K	81349
R6	NOT USED			
R7	NOT USED			
R8	NOT USED			
R9	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R10	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R11	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R12	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
R13	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R14	47 OHM 1/8W 10 RES FXD COMP	651110-0470	RC05GF470K	81349
T1	XFORMER, 1MHZ OUTPUT	75195770		24672
U1	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U2	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER
ASSEMBLY NUMBER 10396031-1
REFERENCE DESIGNATOR PREFIX 1A19
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	NOT USED			
C2	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C3	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C4	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C5	NOT USED			
C6	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C7	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C8	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C9	NOT USED			
C10	470 PF 500V 5 CAP DIP MICA	603000-0471	CM06FD471J03	81349
C11	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C12	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
L1	CHOKE 470UH	751104-0471	MS90537-45	96906
L2	CHOKE 2200UH	751104-0222	MS90537-53	96906
L3	CHOKE 2200UH	751104-0222	MS90537-53	96906
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q4	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q5	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q6	0.31w TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
R1	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R2	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R3	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R4	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R5	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R6	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R7	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R8	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R9	68 OHM 1/4W 10 RES FXD COMP	651102-0680	RC07GF680K	81349
R10	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R11	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R12	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER (CONT)
ASSEMBLY NUMBER 10396031-1
REFERENCE DESIGNATOR PREFIX 1A19
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R13	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R14	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R15	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R16	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R17	68 OHM 1/4W 10 RES FXD COMP	651102-0680	RC07GF680K	81349
R18	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R19	NOT USED			
R20	470 OHM 1/4W 10 RES FXD COMP	651102-0471	RC07GF471K	81349
R21	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R22	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R23	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R24	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R25	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R26	68 OHM 1/4W 10 RES FXD COMP	651102-0680	RC07GF680K	81349
R27	150 OHM 1/4W 10 RES FXD COMP	651102-0151	RC07GF151K	81349
R28	150 OHM 1/4W 10 RES FXD COMP	651102-0151	RC07GF151K	81349
T1	XFORMER, 5MHZ OUTPUT	75195768		24672
T2	XFORMER, 1MHZ OUTPUT	75195770		24672
T3	XFORMER, 1MHZ OUTPUT	75195770		24672
Y1	CRYSTAL, 5MHZ FILTER	752B5000000	4051122-C	74306
Y2	CRYSTAL, 1MHZ FILTER	752A1000000	4051122	74306
Y3	CRYSTAL, 1MHZ FILTER	752A1000000	4051122	74306

7.0 OPTIONAL ASSEMBLIES

7.1 SCOPE OF SECTION

7.1.1 This section lists the special options available and describes the changes to the AUSTRON Model 1210D Portable Crystal Clock for each of these options.

7.2 LIST OF OPTIONAL ASSEMBLIES

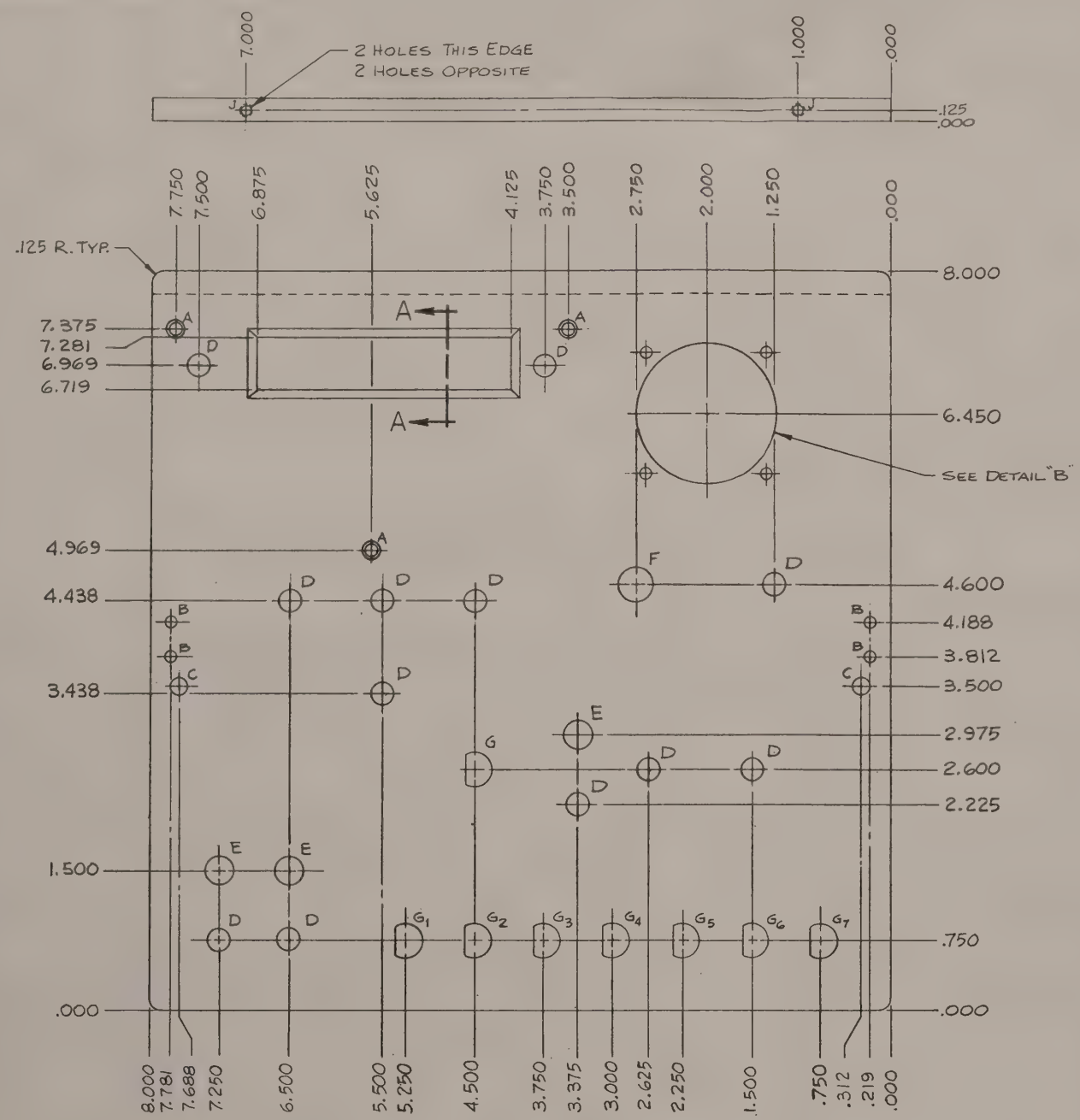
7.2.1 The following is a list of the different options available, and a description of each:

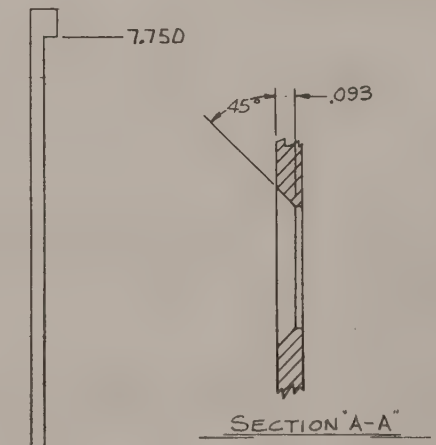
Model Number	Description
1210D-01	10 MHz, 5 MHz, 1 MHz and 100 kHz sinusoidal outputs; 1 PPS pulse output.
1210D-02	5 MHz, 1 MHz, and 60 Hz sinusoidal outputs; 1 PPS and 1 PP10S pulse outputs.
1210D-03	10 MHz, 5 MHz, and 1 MHz sinusoidal outputs; 100 PPS, 1 PPS and 1 PPM pulse outputs.

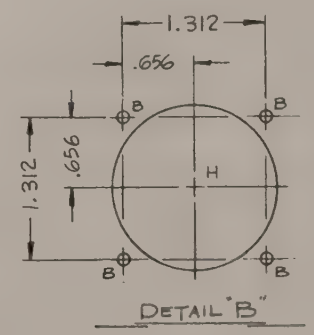
7.2.2 Figure 7-1 may be referenced to show the location of the outputs on the front panel. A chart is included to illustrate the descriptive differences between each unit. Notice also that the reference designators for the additional connectors are included in figure 7-1.

7.2.3 The following sections discuss the difference between each optional assembly and the previously discussed model 1210D assembly. Chassis circuit diagrams, circuit descriptions, schematics and parts list are included, where applicable, for the variations.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	ECO 1231 ALIGNED SILKSCREEN	1/14/76	RDB
	B	ADDED DASH 1; NOTES 5&6; CREATED SILKSCREEN FOR 1210D-01 PER ECO #1718	11-18-76	RDB
	C	ADDED DASH 2; CHANGED NOTE 6 TO INCLUDE -2; CREATED SILKSCREEN FOR -2 PER ECO 2179	12-9-77	RDB
	D	REVISED SILKSCREEN VARIATION BLOCK PER ECO 2278	2-24-78	RDB
	E	ADDED -3 PER ECO # 2325	4-11-78	RDB
	F	REVISED "A" HOLES PER ECO. #2452	1-25-79	RDB
	G	REVISED NOTE 2 & "H" HOLE WAS 1.531, ECO. 3085	10-30-79	RDB
	H	REVISED "G" HOLE REQMTS. FOR -2; REV. NOTES 6&7; ECO 3179	11-14-79	RDB







HOLE SCHEDULE						
LTR	SIZE	QTY REQ'D. NO DASH	-1	-2	-3	REMARKS
A	.111 DIA THRU CSK 82° x .225 DIA	3	3	3	3	
B	.125 DIA	8	8	8	8	
C	.187 DIA	2	2	2	2	
D	.250 DIA	12	12	12	12	
E	.312 DIA	3	3	3	3	
F	.375 DIA	1	1	1	1	
* G	.375 DIA "D" HOLE	5	6	7	7	SEE NOTES 5,6,7&8
H	1.625 DIA	1	1	1	1	
J	#6-32 x .250 DP.	4	4	4	4	

* 8. FOR -3, OMIT HOLE G4.
* 7. FOR -2, OMIT HOLE G1.
* 6. FOR -1, OMIT HOLES G1 & G7.
* 5. FOR NO DASH, OMIT HOLES G_1, G_2 & G_7.
4. RUBBER STAMP P/N ON BACK SIDE OF PANEL.
3. SILKSCREEN WITH BLACK EPOXY PAINT PER ARTWORK OF THE SAME NUMBER AS THIS DWG. APPROPRIATE DASH NUMBER APPLICATION SHOWN ON SHEET 2.
2. FINISH: CLEAR IRIDITE. PAINT FRONT SURFACE ONLY PER AUSTRON SPEC 126 97265.
1. REMOVE ALL BURRS & SHARP EDGES.
NOTES:

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

109 96193-2	1210D-02
109 96193-1	1210D-01
109 96193	1210 D
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWINGS

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES
±.010		

MATERIAL:
.250 STK.
5052-H32 ALUM.

ENGINEER	RDB	8-18-75
CHECKED		
DRAFTSMAN	BARKER	8-14-75

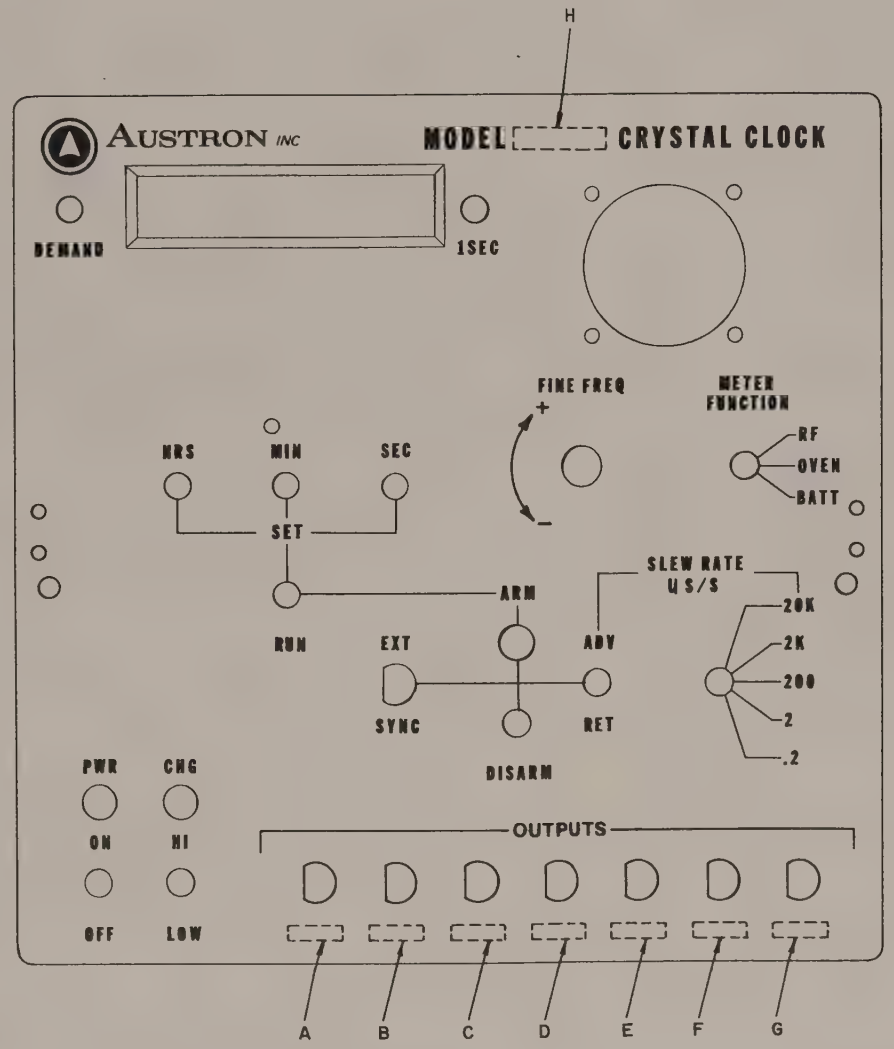
AUSTRON INC. AUSTIN, TEXAS

PANEL - FRONT

SIZE	CODE IDENT NO.		
3	24672	009 96192 *	H
SCALE 1:1		SHEET 1 OF 2	

7-2A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	H	REVISED -2 SILKSCREEN PER ECO # 3179	11-19-77	RDB



APPLY NOMENCLATURE TO THESE POSITIONS PER CHART ABOVE.

NOTE: "J" NUMBERS SHOWN IN PARENTHESIS ARE FOR REFERENCE ONLY AND ARE NOT ON THE SILKSCREEN.

SILKSCREEN VARIATIONS

DASH NO.	POSITION A	B	C	D	E	F	G	H	ARTWORK REV STATUS
NONE	—	—	(J2) 5MHZ	(J3) 1MHZ	(J4) 1MHZ	(J5) 1PPS	—	1210D	C
-1	—	(J2) 10MHZ	(J3) 5MHZ	(J4) 1MHZ	(J5) 100KHZ	(J6) 1PPS	—	1210D-01	B
-2	—	(J2) 5MHZ	(J3) 1MHZ	(J4) 60HZ	(J5) 1PPS	(J6) 1PP10S	(J7) 60PPS	1210D-02	D
-3	(J2) 10MHZ	(J3) 5MHZ	(J4) 1MHZ	—	(J5) 100PPS	(J6) 1PPS	(J7) 1PPM	1210D-03	A

109 96193 *	1210D	1A2	7-1
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR	ISERT	9-5-75
CHECK		
DRFTSMN	BARKER	8-14-75

AUSTRON INC.
AUSTIN, TEXAS

PANEL - FRONT

SIZE	CODE IDENT NO	
3	24672	009 96192 *

SCALE 1:1 SHEET 2 OF 2

7-2B

7.3 MODEL 1210D-01 PORTABLE CRYSTAL CLOCK

7.3.1 The model 1210D-01 Portable Crystal Clock has 10 MHz, 5 MHz, 1 MHz, and 100 kHz sinusoidal outputs as well as a 1 PPS output. These outputs retain the specifications detailed in section 1.3. This version is the same as the model 1210D with the addition of a 100 kHz Output Amplifier (A20). The Output Amplifier (A19) has been replaced with the 10 MHz, 5 MHz, 1 MHz Output Amplifier (AUSTRON Part Number 10397342). The Sine Converter (A18) has the optional 100 kHz section installed. The Final Filter (A3) has been replaced with one having four sections tuned to the appropriate frequencies.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	–	RELEASED	3-15-78	RDB
	A	REVISED PER ECO 2344 & 2366	4-28-78	RDB

EXT DC IN
A10 J1
+22-32 VDC
A11 L1
A11 L2
A11
A11 C1
A11 C2
A6 CR2 MR1125
115/230V 40-400HZ
A10 W1
A10 F1
A2 S10A
T1
A2 S11A
A7
CR1
CR2
CR3
CR4
PWR
A2 DS3
CHG
A2 DS4
HI CHG
A12 C1 .1UF
A12 R1 470Ω
A6 CR1 MR1125
A6 C1 2600 UF
A6 R1 20Ω 10W
A6 R2 200Ω 10W
A2 S11B
A6 CR3 IN5829
A6J1A
P1-A
A1A8
P1-B
A6J1B
A10 F2 1A
A2 S10B
A12 R6 301 K 1%
A10 J2
EXT STD IN
A10 S1
EXT INT STD
RF
OVEN
BATT
A2 S5
A2 M1
+5V
A12 R2 4.7K
A12 R3 4.7K
A12 R4 4.7K
A12 CR1 IN914
A12 Q1
A12 C2 .01
A12 Q2
SET/ RUN
A4 TOD DISPLAY
A5
1PPS
10PPS
AC
SET
RUN
DISPLAY ON
TOD CONTROL
A2 S6
1 SEC
A2 DS1
A2 S2
A2 S3
A2 S4
A2 S1
HRS
MIN
SEC
DEMAND
+15V
A1 J1
MODEL 1150 OSCILLATOR
A1 R1 5.1K 1%
A2 R1 10K, 1% FINE FREQ
A1 R2 15K 1%
A1 R3 4.75K 1%
A12XA21
OUTPUT AMP A12XA20
OUTPUT AMPLIFIER A12XA19
SINE CONVERTER A12XA18
+15V REG. A12XA17
+5V REG. A12XA16
TIME SYNC A12XA15
A3
L4
L3
L1
L2
C4
C3
C1
C2
A2 J5 100KHZ
A2 J4 1MHZ
A2 J2 10MHZ
A2 J3 5MHZ
A6 Q1
A10 F3 2.5A
+15V SOURCE
+5V SOURCE
ADV RET
A2S8
A2 DS2
ENABLE
ARM DISARM
A2 S7
A2 J1 EXT SYNC
A2S9 SLEW RATE
200
2K
20K
DIVIDER A12XA14
PULSE AMPLIFIER A12XA13
A12 R7, 10Ω
A12 R8 10Ω
A12 R9 10Ω
A12 R10 10Ω
A2 J6 1PPS

3. A6Q1 IS AN MJE3055
2. A12Q1 AND A12Q2 ARE 2N3904.
1. ALL RESISTORS 1/4W 10% UNLESS OTHERWISE SPECIFIED.

NOTES:

127 96207	1210D-01		7-2
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL N/A

ENGR		1/-
CHECK		
DRFTSMN	LDP	2/23/78

AUSTRON INC. AUSTIN, TEXAS

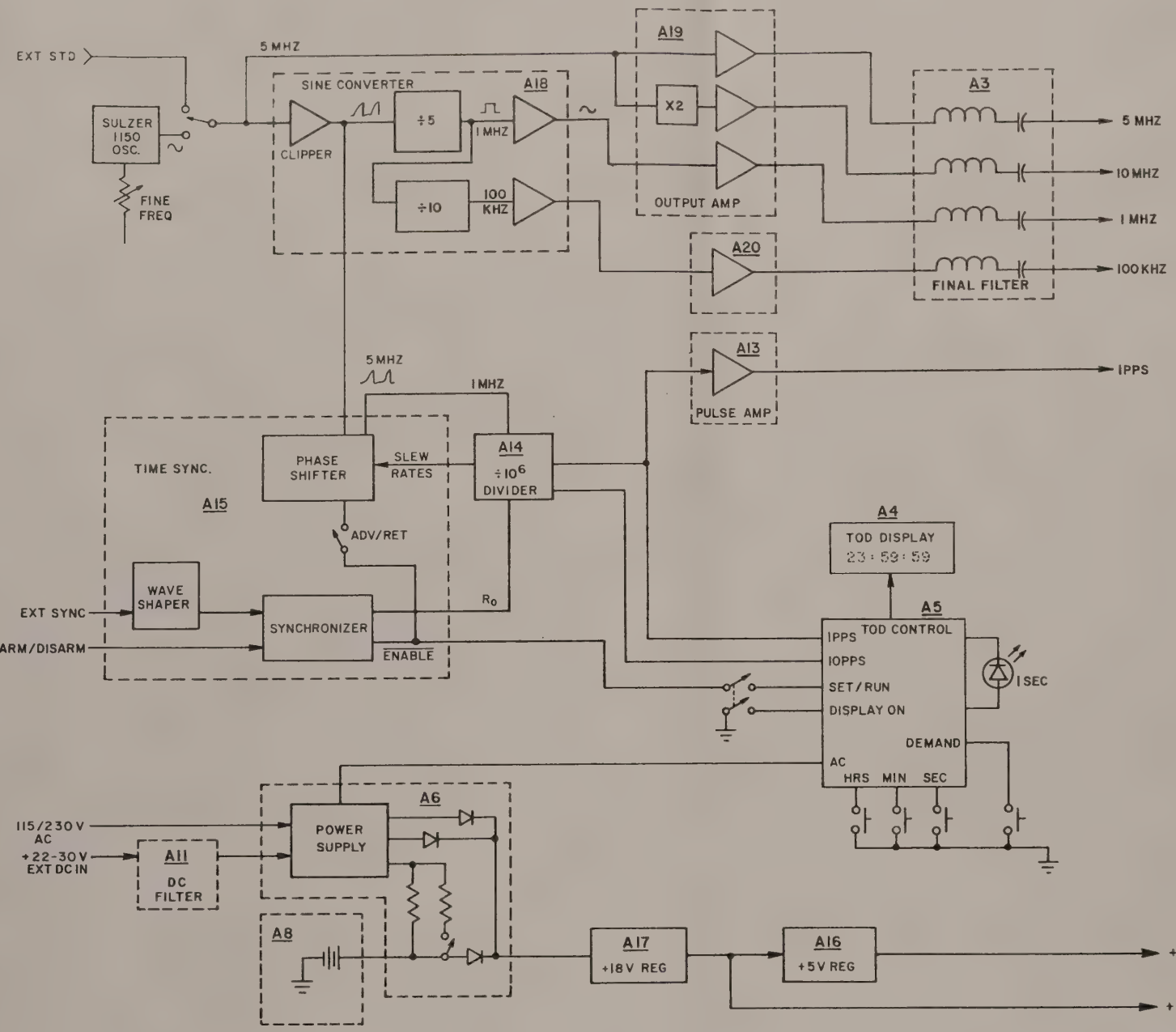
SCHEMATIC DIAGRAM - 1210D-01 CRYSTAL CLOCK

SIZE	CODE IDENT NO		
4	24672	123 96570	A

SCALE N/A SHEET 1 OF 1

7-3A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	5-1-78	KVS



				TOLERANCES UNLESS OTHERWISE SPECIFIED			
				DECIMALS	FRACTIONS	ANGLES	
				MATERIAL:			
127 96207	1210D-01		7-3				
NEXT ASSY	USED ON	REF DES	FIG NO				
APPLICATION				ENGR	L.D. Scott	2-23-78	
				CHECK	R. Bracken	2-22-78	
				DRFTSMN	S. Schmidt	2-22-78	

AUSTRON INC.
AUSTIN, TEXAS

BLOCK DIAGRAM
1210D-01 CRYSTAL CLOCK

SIZE	CODE IDENT NO	
3	24672	124 96555

SCALE NA | SHEET 1 OF 1

7-3B

ASSEMBLY CRYSTAL CLOCK, MODEL 1210D-01
ASSEMBLY NUMBER 32196206-1
REFERENCE DESIGNATOR PREFIX
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	PCB ASSY, EXTENDER	10393765		24672
	MANUAL	12796207		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONN MS-TYPE 3-PIN FEMALE	551106-0017	MS3106A-14S-1S	74861
	TUNING WAND	901000-8605	8605	20018
1	FINAL ASSY, MODEL 1210D	27196208-1		24672

ASSEMBLY FINAL ASSY, MODEL 1210D
ASSEMBLY NUMBER 27196208-1
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	NOT USED			
A2	PANEL ASSY, FRONT	10996193-1		24672
A3	PCB ASSY, FINAL FILTER	10397355		24672
A4	PCB ASSY, TOD DISPLAY	10396186		24672
A5	PCB ASSY TOD CONTROL	10396188		24672
A6	PLATE ASSY	11096211		24672
A7	PCB ASSY, BRIDGE	10394664		24672
A8	BATTERY PACK ASSY	12096212		24672
A9	XTLOSC, 1150 (70-85 DEG)	30296818		24672
A10	PANEL ASSY, REAR	10996195		24672
A11	PCB ASSY, DC FILTER	10396200		24672
A12	PCB ASSY, INTERCONNECT	10396769		24672
A13	PCB ASSY, PULSE AMPLIFIER	10394595-1		24672
A14	PCB ASSY DIVIDER	10396614		24672
A15	PCB ASSY, TIME SYNC	10394618		24672
A16	PC BOARD ASSY T5VDC REGULATOR	10394607		24672
A17	PCB ASSY, +15 VDC REGULATOR	10396197		24672
A18	PC BOARD ASSY-SINE CONVERTER	10396025		24672
A19	PCB ASSY, 10,5,1 MHZ OUTPUT AMP	10397342		24672
A20	PCB ASSY, 100KHZ OUTPUT AMPLIFIER	10397359		24672
MP1	COVER, FRONT	00794304		24672
MP2	COVER INSTRUMENT	00796209-1		24672
MP3	COVER INSTRUMENT	00796209-2		24672
MP4	BAR RECTANGULAR	01096753		24672
MP5	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP6	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP7	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP8	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP9	WASHER, PRELOAD	02096741		24672
MP10	WASHER, PRELOAD	02096741		24672
MP11	WASHER, PRELOAD	02096741		24672
MP12	WASHER, PRELOAD	02096741		24672
MP14	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519

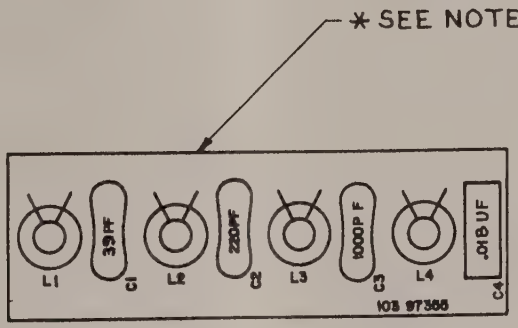
ASSEMBLY FINAL ASSY, MODEL 1210D (CONT)
ASSEMBLY NUMBER 27196208-1
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
MP15	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP16	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP17	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP18	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP19	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP20	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP21	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP22	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP23	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP24	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP25	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330

ASSEMBLY PCB ASSY, FINAL FILTER
ASSEMBLY NUMBER 10397355
REFERENCE DESIGNATOR PREFIX 1A3
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	39PF 500V 5 CAP DIP MICA	603000-0390	DM15-390J	00000
C2	220PF 500V 5 CAP DIP MICA	603000-0221	CM05221G	09023
C3	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C4	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
L1	10MHZ FILTER INDUCTOR	75197470		24672
L2	5MHZ FILTER INDUCTOR 4.6UH	75197469		24672
L3	1MHZ FILTER INDUCTOR 25UH	75197468		24672
L4	INDUCTOR, 100KHZ FILTER	75197467		24672

APPLICATION		REVISIONS			
EXT ASSY	USED ON	LTR	DESCRIPTION	DATE	APPROVED
10996193-1	1210D-01	–	RELEASED	11-19-76	RJB
10996193-3	1210D-03	A	C1 WAS 22 PF; C4 WAS .01 UF, PER ECO 1826	12-14-77	RJB
		B	ADDED -1 PER ECO # 2328	4-26-78	RDB



2. P/N 103 97355 AS SHOWN, FOR P/N 103 97355-1
OMIT L4 AND C4. (ADD "-1" TO P/N MARKING AS REQ'D.)

1. MOUNT CHOKES WITH NYLON ROD.

NOTES:

ENGINEER	RPH	11-30-76	
CHECKED	RJB	11-30-76	
DRAFTSMAN	BARKER	11-19-76	

AUSTRON INC. AUSTIN, TEXAS

PC BOARD ASSY – FINAL FILTER

REF DES	FIG NO	SIZE	CODE IDENT NO.		
A3	7-4	1	24672	103 97355 *	B

SCALE 1:1 SHEET OF

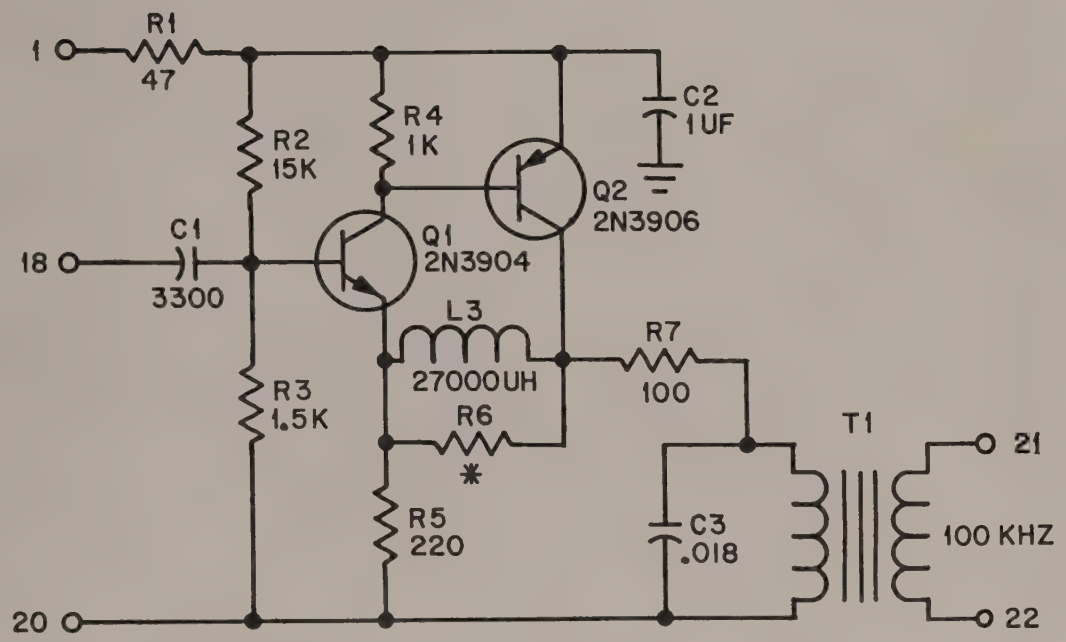
7.3.2 100 kHz Output Amplifier -- The pcb (A20) has an output amplifier capable of supplying 1 V RMS into a 50 lhm load.

7.3.2.1 The transistors Q1 and Q2 form a two-stage common-emitter, collector-tuned amplifier with negative feedback. The feedback ratio is determined by R5 and R6, which are used to set the output level. The output amplifier has been designed to allow a minimum level change for a maximum load change.

ASSEMBLY PCB ASSY, 10,5,1 MHZ OUTPUT AMP
ASSEMBLY NUMBER 10397342
REFERENCE DESIGNATOR PREFIX 1A19
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C2	SELECTED CAP DIP MICA			
C3	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C4	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C5	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C6	SELECTED CAP DIP MICA			
C7	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C8	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C9	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C10	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C11	4.7 UF 35V 10 CAP TANT	608017-0475	CS13BF475K	81349
C12	NOT USED			
C13	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C14	SELECTED CAP DIP MICA			
C15	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C16	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
L1	47UH CHOKE	751101-0470	1025-60	99800
L2	47UH CHOKE	751101-0470	1025-60	99800
L3	47UH CHOKE	751101-0470	1025-60	99800
L4	47UH CHOKE	751101-0470	1025-60	99800
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q3	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q4	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q5	U257 FET, TRANSISTOR	702U257	U257	17896
Q6	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q7	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
R1	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R2	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R3	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R4	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R5	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R6	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	–	RELEASED	11-18-76	RDB



1. * SELECT FOR OUTPUT LEVEL 1V RMS INTO 50 OHMS.

NOTES:

103 97359	1210D-01	A20	7-5
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG

MATERIAL:

ENGR		
CHECK		
DRFTMN	BARKER	

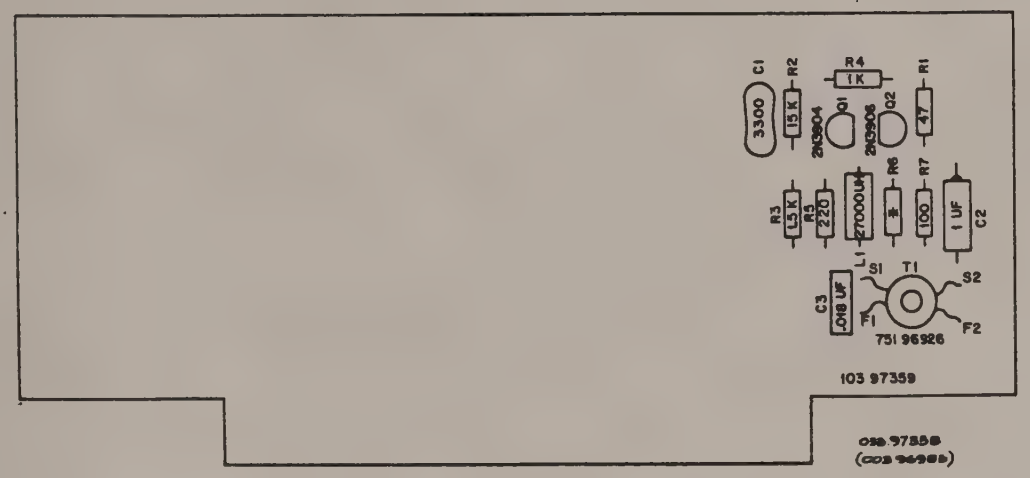
AUSTRON INC
AUSTIN, TEXAS

SCHEMATIC DIAGRAM -
100 KHZ OUTPUT AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	123 97357	
SCALE		SHEET	OF

7-4B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	11-23-76	RDB
	A	ADDED S1, S2, F1, F2 PER ECO. 1996	6-28-77	RDB
	B	PARTS LIST CHANGE PER ECO 2271	4-14-78	RDB



				TOLERANCES UNLESS OTHERWISE SPECIFIED		
				DEC	FRAC	ANG
				MATERIAL:		
9.08-1	[illegible]	A20	7-6	ENGR		
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK		
APPLICATION				DRFTMN		

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY. - 100 KHZ
OUTPUT AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	103 97359	B
SCALE			SHEET OF

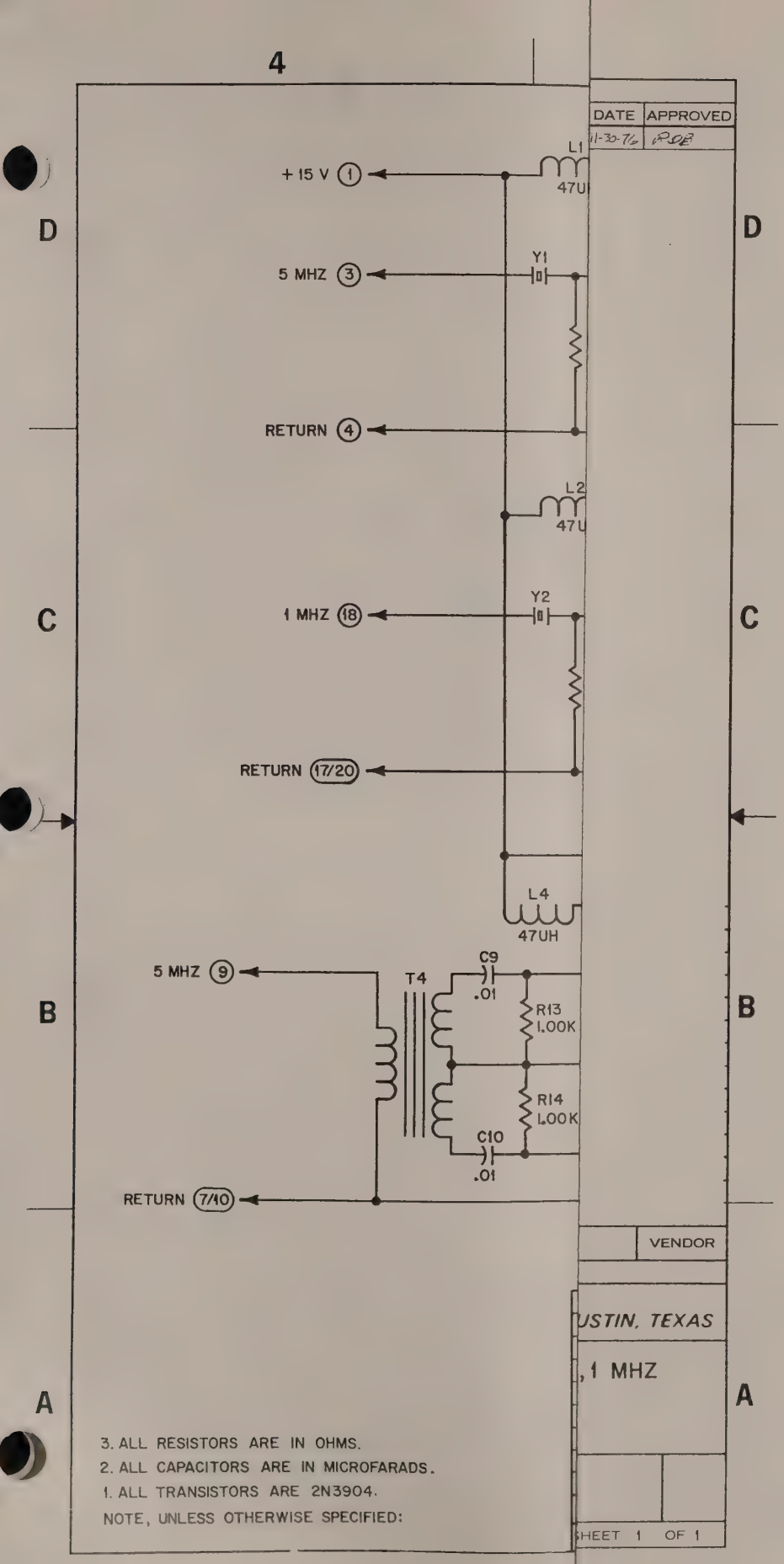
74C

ASSEMBLY PCB ASSY, 10,5,1 MHZ OUTPUT AMP (CONT)
ASSEMBLY NUMBER 10397342
REFERENCE DESIGNATOR PREFIX 1A19
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R7	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R8	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R9	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R10	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R11	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R12	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R13	1 K 1/8W 1 RES FXD FILM	653001-1001	RN55D1001F	81349
R14	1 K 1/8W 1 RES FXD FILM	653001-1001	RN55D1001F	81349
R15	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R16	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R17	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R18	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R19	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R20	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R21	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
T1	TRANSFORMER-5MHZ OUTPUT W/FEEDBK	75197348		24672
T2	XFMR-1 MHZ OUTPUT W/FEEDBACK	75197349		24672
T3	XFMR 10 MHZ OUTPUT W/FEEDBACK	75197347		24672
T4	XFMR WIDE BAND PHASE SPLITTING	75197346		24672
Y1	CRYSTAL, 5MHZ FILTER	752R5000000	4051122-C	74306
Y2	CRYSTAL, 1MHZ FILTER	752A1000000	4051122	74306
Y3	XTAL 10.000MHZ	752A10000000	4051122	74306

7.3.3 10 MHz, 5 MHz, and 1 MHz Output Amplifier -- The Output Amplifier (A19) contains three similar amplifiers, plus a multiplier. This description will consider the 10 MHz amplifier.

7.3.3.1 Transformer T4 and dual transistor Q5 (along with their associated componenets) form a push-push doubler. The resulting 10 MHz signal is filtered by one-third (1/3). Since the signal from the emitter follower (Q6) is feed to the common-emitter, collector-tuned amplifier (Q7) through a winding on transformer T3, the stage has ac feedback. This amplifier is capable of supplying 1 V RMS into a 50 ohm load and is releatively insensitive to load changes.

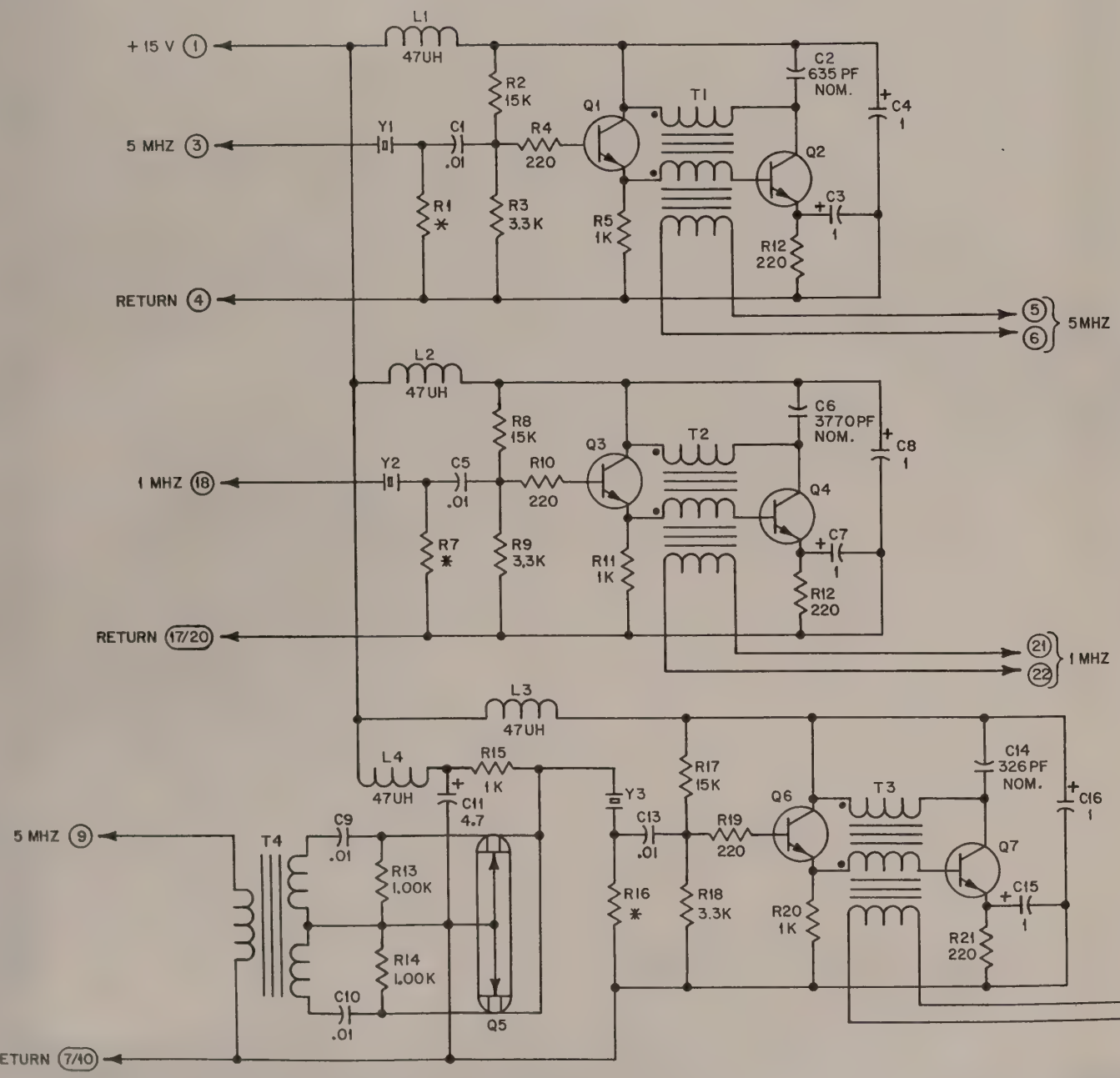

4
DATE
APPROVED
11-30-76
+15 V (1)
L1
47U
5 MHZ (3)
Y1
RETURN (4)
L2
47U
1 MHZ (18)
Y2
RETURN (17/20)
L4
47UH
5 MHZ (9)
T4
C9
.01
R13
1.00K
R14
1.00K
C10
.01
RETURN (7/10)
D
C
B
A
VENDOR
USTIN, TEXAS
, 1 MHZ
3. ALL RESISTORS ARE IN OHMS.
2. ALL CAPACITORS ARE IN MICROFARADS.
1. ALL TRANSISTORS ARE 2N3904.
NOTE, UNLESS OTHERWISE SPECIFIED:
SHEET 1 OF 1

7-5A

7.3.3 10 MHz, 5 MHz, and 1 MHz Output Amplifier -- The Output Amplifier (A19) contains three similar amplifiers, plus a multiplier. This description will consider the 10 MHz amplifier.

7.3.3.1 Transformer T4 and dual transistor Q5 (along with their associated componenets) form a push-push doubler. The resulting 10 MHz signal is filtered by one-third (1/3). Since the signal from the emitter follower (Q6) is feed to the common-emitter, collector-tuned amplifier (Q7) through a winding on transformer T3, the stage has ac feedback. This amplifier is capable of supplying 1 V RMS into a 50 ohm load and is releatively insensitive to load changes.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	—	RELEASED	11-30-76	[illegible]



QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1				LIST OF MATERIAL	

3. ALL RESISTORS ARE IN OHMS.
2. ALL CAPACITORS ARE IN MICROFARADS.
1. ALL TRANSISTORS ARE 2N3904.
NOTE, UNLESS OTHERWISE SPECIFIED:

103 97342	1210D-01	A19	7-7
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
DO NOT SCALE DRAWINGS

TOLERANCES
UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGINEER	LRH	11-30-76
CHECKED		
DRAFTSMAN	BARKER	11-29-76

AUSTRON INC. AUSTIN, TEXAS

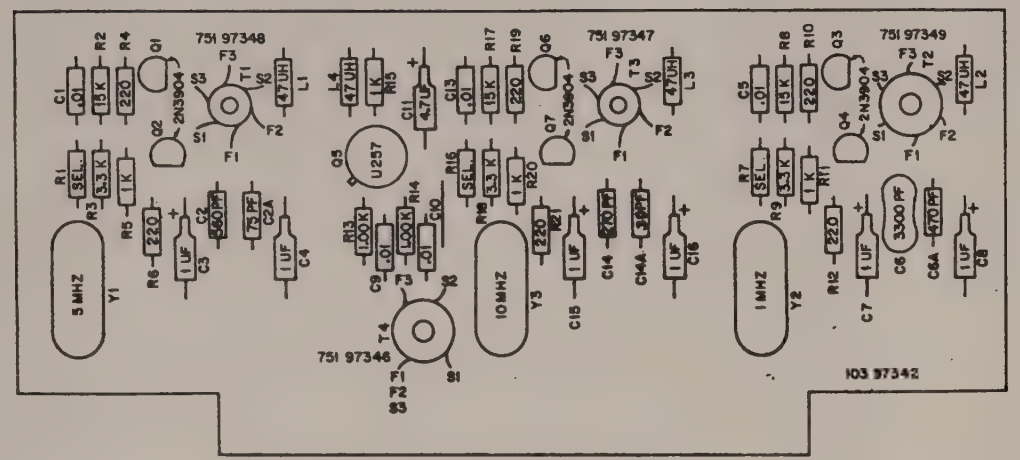
SCHEMATIC DIAGRAM - 10,5,1 MHZ
OUTPUT AMPLIFIER

SIZE	CODE IDENT NO	
3	24672	123 97364

SCALE N/A | SHEET 1 OF 1

7-5A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	-	RELEASED	11-18-76	RDB
	A	ECO 1991: C14A WAS 56 PF	6-28-77	RDB
	B	REVISED PARTS LIST PER ECO. 2886	4-16-79	RDB



				TOLERANCES UNLESS OTHERWISE SPECIFIED		
				DEC	FRAC	ANG
				MATERIAL:		
2719623?	1210D-?1	A19	78	ENGR	RDB	11-?
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK		
APPLICATION				DRFTMN		

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY - 10, 5, 1 MHZ
OUTPUT AMPLIFIER

SIZE	CODE IDENT NO		
2	24672	103 97342	B

SCALE | SHEET OF

7-5B

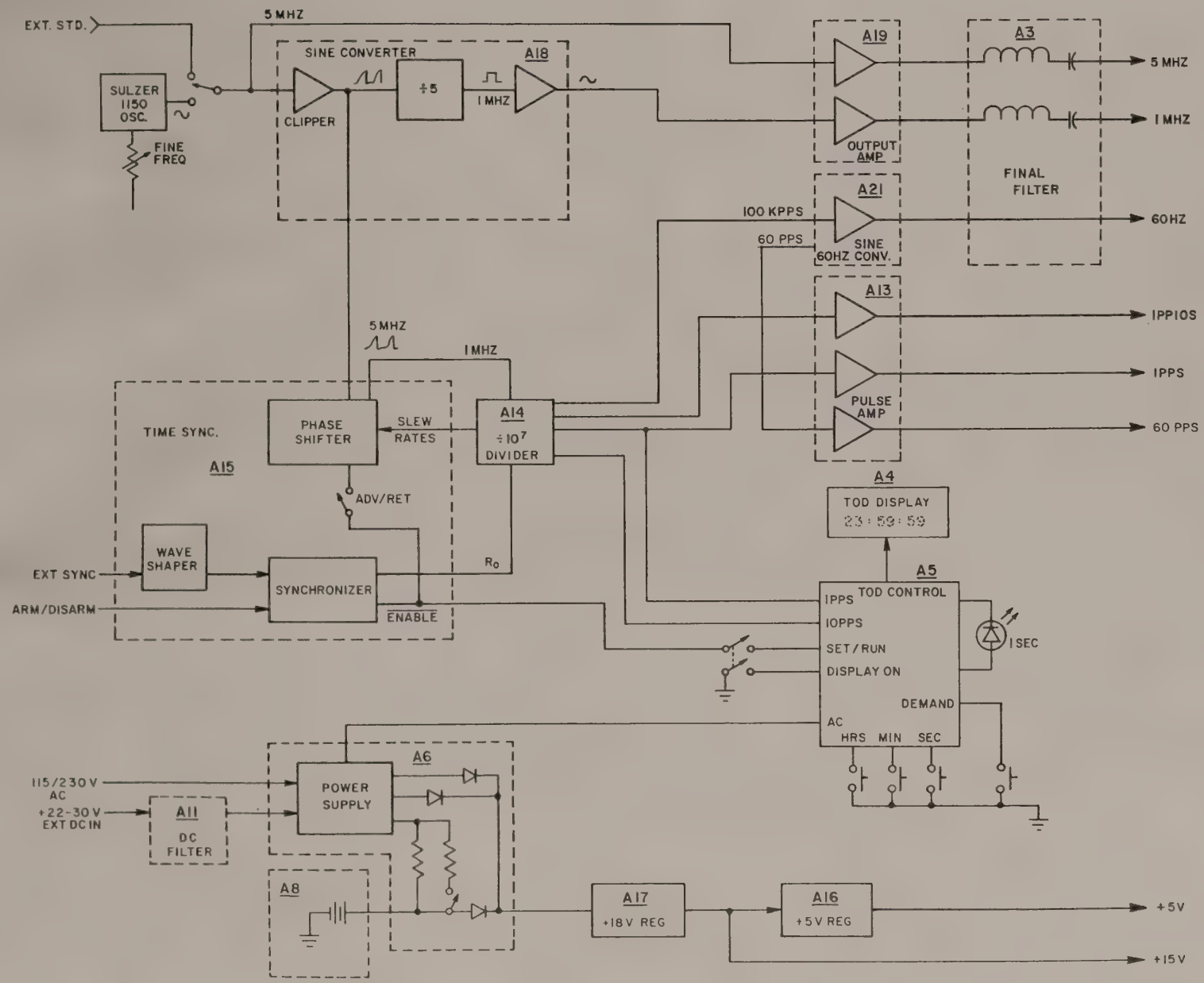
ASSEMBLY PCB ASSY, 100KHZ OUTPUT AMPLIFIER
ASSEMBLY NUMBER 10397359
REFERENCE DESIGNATOR PREFIX 1A20
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	3300 PF 500V 5 CAP DIP MICA	603000-0332	CM06FD332J03	81349
C2	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C3	.018 UF 50V 10 CAP FILM	607050-0183	65F11AA183	01002
L1	CHOKE 27000UH	751104-0273	MS90537-65	96906
Q1	0.31W TO-92 XSTR NPN5 SH	7022N3904	2N3904	81349
Q2	0.31W TO-92 XSTR PNP5 SH	7022N3906	2N3906	81349
R1	47 OHM 1/4W 10 RES FXD COMP	651102-0470	RC07GF470K	81349
R2	15 K 1/4W 10 RES FXD COMP	651102-0153	RC07GF153K	81349
R3	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R4	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R5	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R6	SELECTED1/4W 10 RES FXD COMP	651102-SEL		
R7	100 OHM 1/4W 10 RES FXD COMP	651102-0101	RC07GF101K	81349
T1	TRANSFORMER 100 KHZ	75196926		24672

7.4 MODEL 1210D-02 PORTABLE CRYSTAL CLOCK

7.4.1 The model 1210D-02 Portable Crystal Clock has 5 MHz, 1 MHz, and 60 Hz sinusoidal outputs, as well as 1 PPS and 1 PP10S pulse outputs. These outputs retain the specifications detailed in section 1.3. This version is the same as the model 1210D, with the addition of a 60 Hz Sine Converter pcb (A21), as well as the modification of the Divider pcb (A14), the Pulse Amplifier pcb (A13), and the Final Filter pcb (A3).

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	3-16-78	RDB
	A	ADDED 60 PPS LINE PER ECO 3180	11-13-79	RDB



				TOLERANCES UNLESS OTHERWISE SPECIFIED		
				DECIMALS	FRACTIONS	ANGLES
				MATERIAL:		
127 96207	1210D-02		7-9			
NEXT ASSY	USED ON	REF DES	FIG NO			
APPLICATION				ENGR	[illegible]	2-23-78
				CHECK	[illegible]	[illegible]
				DRFTSMN	S. Schmidt	2-21-78

AUSTRON INC.
AUSTIN, TEXAS

BLOCK DIAGRAM
1210D-02 CRYSTAL CLOCK

SIZE	CODE IDENT NO		
3	24672	124 96556	A

SCALE NA | SHEET 1 OF 1

7-6A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	3-15-78	RDB
	A	REVISED PER ECO 2343 & 2365	4-17-78	RDB
	B	REVISED PER ECO 3178	11-14-79	RDB

EXT DC IN
A10 J1
+22-32 VDC
115/230V 40-400HZ
A10 W1
A10F1
A2 S10A
A2 S10B
A10F2
A1A8
A6J1A
A6J1B
A11 L1
A11 L2
A11 C1
A11 C2
A6 CR2 MR1125
A6 CR1 MR1125
A6 CR3 IN5829
A7 CR1 CR2 CR3 CR4
A2 S11A
A2 S11B
PWR A2 DS3
CHG A2 DS4
HI CHG
A6 C1 2600 UF
A6 R1 20Ω 10W
A6 R2 200Ω 10W
A12 C1 .1UF
A12 R1 470Ω
A12 R6 301 K 1%
A12 CR1 IN914
A12 Q1
A12 Q2
A12 C2 .01
A12 R2 4.7K
A12 R3 4.7K
A12 R4 4.7K
+5V
SET/RUN
A2 S6
A4 TOD DISPLAY
A5 TOD CONTROL
1PPS
10PPS
AC
SET
RUN
DISPLAY ON
1 SEC
A2 DS1
A2 S2 HRS
A2 S3 MIN
A2 S4 SEC
A2 S1 DEMAND
A10 J2 EXT STD IN
A10 S1 EXT INT STD
RF
A2 S5 OVEN BATT
A2 M1
+15V
A1J1
MODEL 1150 OSCILLATOR
A1R1 5.11K 1%
A2 R1 10K, 1% FINE FREQ
A1R2 15K 1%
A1R3 4.75K 1%
60HZ SINE CONV A12XA21
A12XA20
OUTPUT AMPLIFIER A12XA19
SINE CONVERTER A12XA18
+15V REG. A12XA17
+5V REG. A12XA16
TIME SYNC A12XA15
DIVIDER A12XA14
PULSE AMPLIFIER A12XA13
A3 L2 C2 L1 C1
A2 J4 60HZ
A2 J3 1 MHZ
A2 J2 5MHZ
A6 Q1
A10 F3 2.5A
+15V SOURCE
+5V SOURCE
ADV RET
A2S8
A2 DS2
ENABLE
ARM DISARM
A2 S7
A2 J1 EXT SYNC
A2S9 SLEW RATE
2
200
2K
20K
A12 R7, 10Ω
A12 R8, 10Ω
A12 R9 10Ω
A12 R10 10Ω
A2 J6 1PP10S
A2 J5 1PPS
A2 J7 60PPS

3. A6Q1 IS AN MJE3055
2. A12Q1 AND A12Q2 ARE 2N3904.
1. ALL RESISTORS 1/4W 10% UNLESS OTHERWISE SPECIFIED.

NOTES:

127 96207	1210D-02		7-10
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL N/A

ENGR		
CHECK		
DRFTSMN	LDP	2/23/78

AUSTRON INC. AUSTIN, TEXAS

SCHEMATIC DIAGRAM - 1210D-02 CRYSTAL CLOCK

SIZE	CODE IDENT NO		
4	24672	123 96571	B

SCALE NA SHEET 1 OF 1

7-6B

ASSEMBLY CRYSTAL CLOCK, MODEL 1210D-02
ASSEMBLY NUMBER 32196206-2
REFERENCE DESIGNATOR PREFIX
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	PCB ASSY, EXTENDER	10393765		24672
	MANUAL	12796207		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONN MS-TYPE 3-PIN FEMALE	551106-0017	MS3106A-14S-1S	74861
	TUNING WAND	901000-8605	8605	20018
1	FINAL ASSY, MODEL 1210D	27196208-2		24672

ASSEMBLY FINAL ASSY, MODEL 1210D
ASSEMBLY NUMBER 27196208-2
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	NOT USED			
A2	PANEL ASSY FRONT 1210D	10996193-02		
A3	PCB ASSY, OUTPUT FILTER	10396735-1		24672
A4	PCB ASSY, TOD DISPLAY	10396186		24672
A5	PCB ASSY TOD CONTROL	10396188		24672
A6	PLATE ASSY	11096211		24672
A7	PCB ASSY, BRIDGE	10394664		24672
A8	BATTERY PACK ASSY	12096212		24672
A9	XTLOSC, 1150 (70-85 DEG)	30296818		24672
A10	PANEL ASSY, REAR	10996195		24672
A11	PCB ASSY, DC FILTER	10396200		24672
A12	PCB ASSY, INTERCONNECT	10396769		24672
A13	PCB ASSY, PULSE AMPLIFIER	10394595-3		24672
A14	PCB ASSY, DIVIDER	10396614-1		24672
A15	PCB ASSY, TIME SYNC	10394618		24672
A16	PC BOARD ASSY T5VDC REGULATOR	10394607		24672
A17	PCB ASSY, +15 VDC REGULATOR	10396197		24672
A18	PCB ASSY, SINE CONVERTER	10396025-1		24672
A19	PCB ASSY, OUTPUT AMPLIFIER	10396031-1		24672
A20	NOT USED			
A21	PCB ASSY, 60HZ SINE CONVERTER	10396517		24672
MP1	COVER, FRONT	00794304		24672
MP2	COVER INSTRUMENT	00796209-1		24672
MP3	COVER INSTRUMENT	00796209-2		24672
MP4	BAR RECTANGULAR	01096753		24672
MP5	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP6	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP7	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP8	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP9	WASHER, PRELOAD	02096741		24672
MP10	WASHER, PRELOAD	02096741		24672
MP11	WASHER, PRELOAD	02096741		24672
MP12	WASHER, PRELOAD	02096741		24672

ASSEMBLY FINAL ASSY. MODEL 1210D (CONT)
ASSEMBLY NUMBER 27196208-2
REFERENCE DESIGNATOR PREFIX 1
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
MP14	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP15	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP16	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP17	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP18	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP19	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP20	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP21	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP22	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP23	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP24	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP25	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330

7.4.2 60 Hz Sine Converter -- This pcb (A21) generates a 60 Hz sine wave from a 100 kHz TTL input.

7.4.2.1 A 100 kHz square wave is applied to the base of Q1 which is a common-emitter, collector-tuned amplifier, which is tuned to the third harmonic, 300 kHz. Therefore, there is a multiplication of three in this stage.

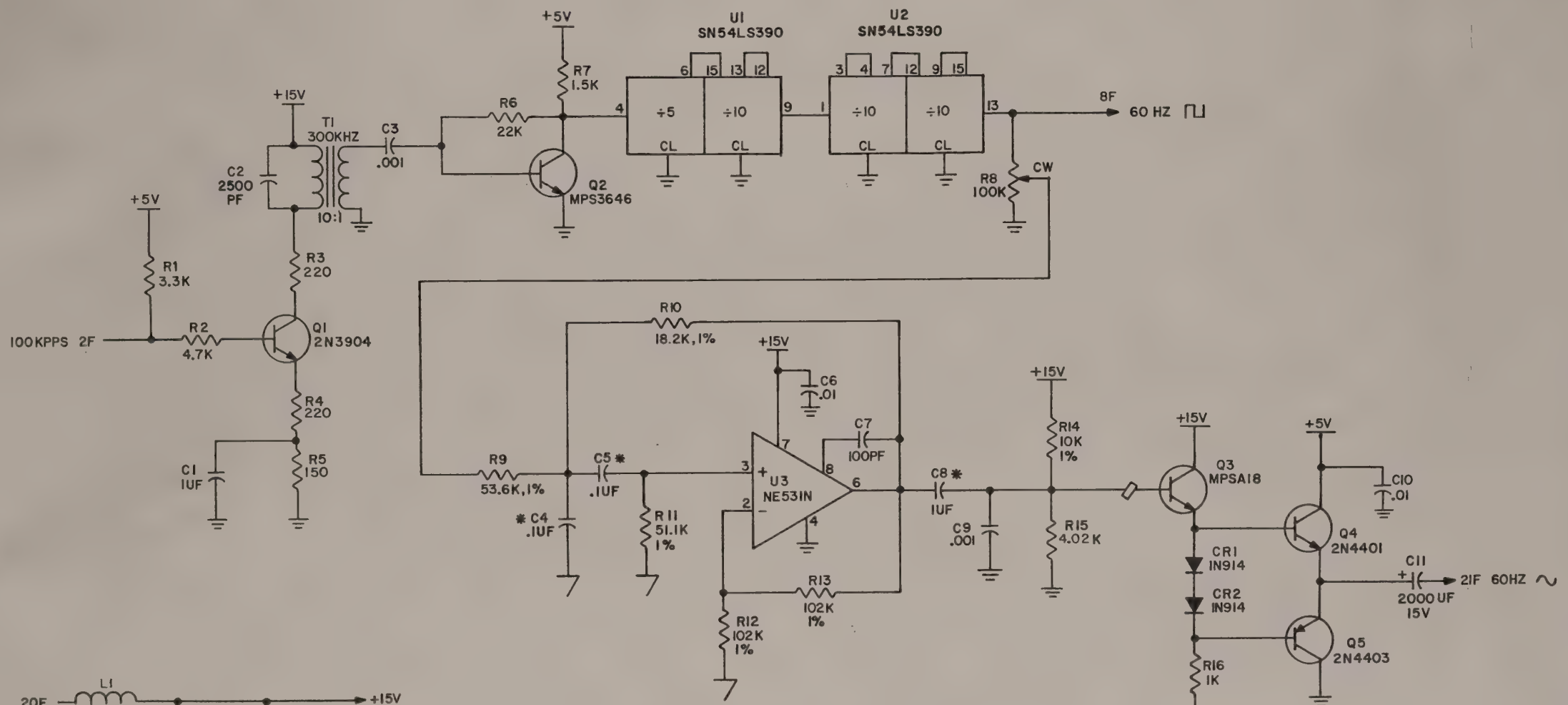
7.4.2.2 Transistor Q2 is a saturated clipper which is used to generate a fast fall time suitable for driving the TTL dividers.

7.4.2.3 The integrated circuits U1 and U2 are cascaded dividers which divide the 300 kHz signal to 60 Hz.

7.4.2.4 Op Amp U3 is a second-order VCVS bandpass filter which has a Q=10 with G=10 at fo=60 Hz. In a filter of this configuration the op amp and resistors R12 and R13 form a voltage controlled source. Resistor R12 and R13 set the gain while capacitors C4 and C5 and resistors R9, R10 and R11 set the center frequency as well as the Hi and Lo roll off response.

7.4.2.5 Transistor Q3, whose base bias is derived from resistors R14 and R15, is a driver stage for the push-pull, capacitor-coupled output amplifier, which is composed of CR1, CR2, Q4, Q5 and associated components. This amplifier is capable of supplying 1 V RMS into a 50 ohm load.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	A	REDRAWN PER ECO 3113	[illegible]	RA



2. * POLYCARBONATE CAPACITOR.

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4 W, 10% WITH VALUES IN OHMS, AND ALL CAPACITANCE VALUES ARE IN MICROFARADS.

NOTES:

10396517	1210D-02	A21	7-11
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL:

ENGR		
CHECK		
DRFTSMN	LDP	9-28-79

AUSTRON INC.
AUSTIN, TEXAS

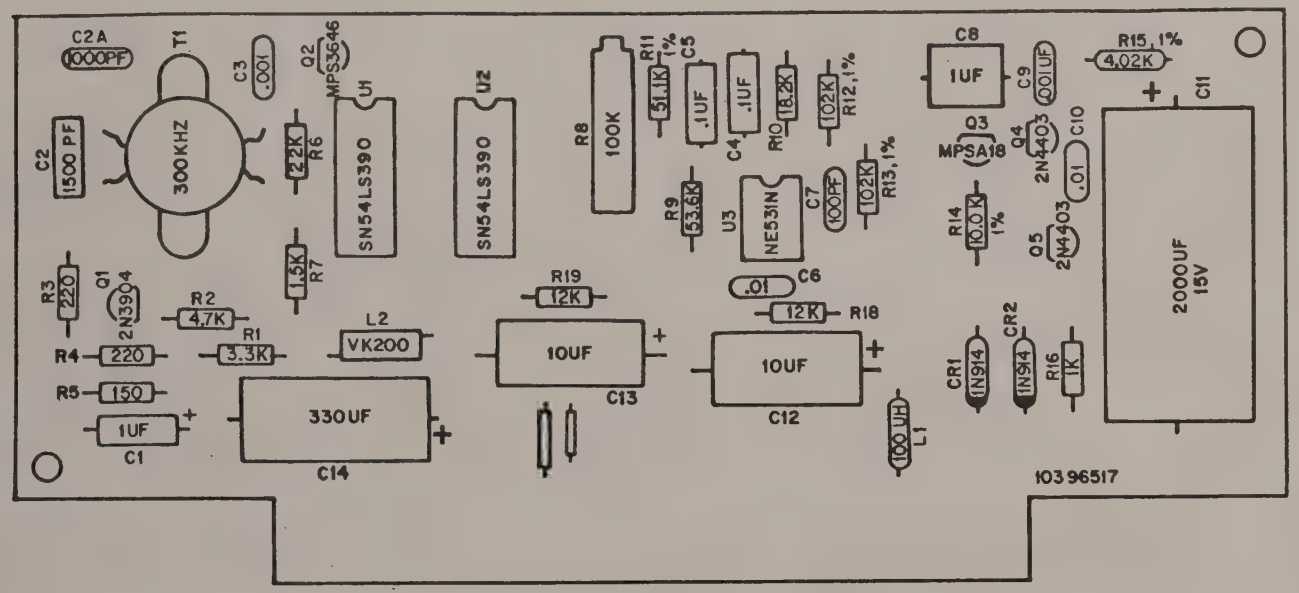
SCHEMATIC, 60 HZ SINE CONVERTER

SIZE	CODE IDENT NO	
3	24672	12396518

SCALE | SHEET OF

7-7A

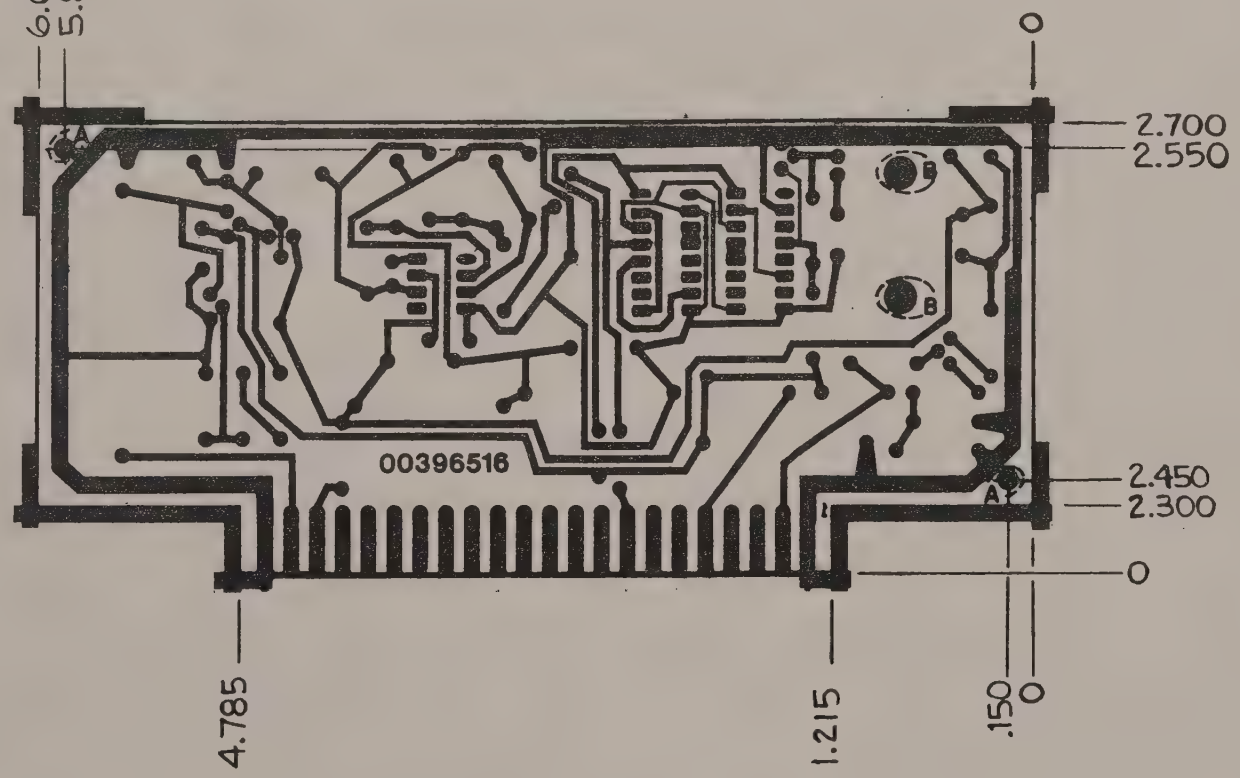
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	A	REDRAWN PER ECO 3119	11-16-79	RJB



				TOLERANCES UNLESS OTHERWISE SPECIFIED			AUSTRON INC AUSTIN, TEXAS			
				DEC	FRAC	ANG	PC BOARD ASSY, 60 HZ SINE CONVERTER			
				MATERIAL:						
27196208-2	1210D-02	A21	7-12	ENGR	LRH	11-16-79	SIZE 2	CODE IDENT NO 24672	10396517	A
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK			SCALE NONE		SHEET OF	
APPLICATION				DRFTMN	BARKER	11-16-79				

7-7.B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	A	RELEASED	11-16-79	ROB



HOLE SCHEDULE			
LTR	DESCRIPTION	QTY	REMARKS
A	#36 (.106) DIA	2	
B	1/8 (.125) DIA	2	
*	#65 (.035) DIA	—	UNMARKED

ARTWORK REV STATUS	
ETCH	A
SCREEN	—

4. SILKSCREEN FAR SIDE OF BOARD PER ARTWORK OF THE SAME NUMBER AS THIS DWG.
3. ETCH SIDE PER ARTWORK OF THE SAME NUMBER AS THIS DWG.
2. FINISHED BOARD SHALL CONFORM TO AUSTRON SPEC 126 96190.
1. THE FINISH OF THE BOARD SHALL BE A MINIMUM OF 300 MICRO-INCHES OF RE-FLOWED TIN LEAD PLATE EXCEPT THE CONNECTOR TAB AREA WHICH SHALL BE 50 MICRO-INCHES OF GOLD OVER 300-500 MICRO-INCHES OF NICKEL,

NOTES:

NEXT ASSY	USED ON	REF DES	FIG NO
10396517	1210D-02		

APPLICATION

TOLERANCES UNLESS OTHERWISE SPECIFIED

DEC	FRAC	ANG
±.020		

MATERIAL: .062 THK. G-10 2 OZ. COPPER CLAD 1 SIDE

ENGR	RPH	11-16-79
CHECK	R Barker	11-16-79
DRFTMN	LDP	10-24-79

AUSTRON INC
AUSTIN, TEXAS

PC BOARD, 60 HZ SINE CONVERTER

SIZE	CODE IDENT NO		
2	24672	00396516	A

SCALE 1/1 SHEET 1 OF 1

7-7C

ASSEMBLY PCB ASSY, 60HZ SINE CONVERTER
ASSEMBLY NUMBER 10396517
REFERENCE DESIGNATOR PREFIX 1A21
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	1 UF 35V 10 CAP TANT	608017-0105	CS13BF105K	81349
C2	1000 PF 500V 5 CAP DIP MICA	603000-0102	CM05FA102J03	81349
C2A	CAP 1500PF DM	603000-0152		00000
C3	.001 UF 100V 10 CAP CERAMIC	601105-0102	CN20A102K	71590
C4	.1 UF 50V 5 CAP POLYCARB	610008-0104		
C5	.1 UF 50V 5 CAP POLYCARB	610008-0104		
C6	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C7	100 PF 100V 10 CAP CERAMIC	601105-0101	CN15A101K	71590
C8	1 UF 50V 5 CAP POLYCARB	610008-0105		
C9	.001 UF 100V 10 CAP CERAMIC	601105-0102	CN20A102K	71590
C10	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C11	2000UF 15V CAP ELECTROLYTIC	602000-0013	TC1520C	90201
C12	10 UF 35V 10 CAP TANT	608017-0106	00>@<	81349
C13	10 UF 35V 10 CAP TANT	608017-0106	00>@<	81349
C14	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
CR1	PRV75 DIO S SIG	7011N914	1N914	81349
CR2	PRV75 DIO S SIG	7011N914	1N914	81349
Q1	0.31W TO-92 XSTR NPNS SH	7022N3904	2N3904	81349
Q2	0.50W TO-92 XSTR NPNS SH	702MPS3646	MPS3646	04713
Q3	0.31W TO-92 XSTR NPNS A	702MPSA18	MPSA18	04713
Q4	0.31W TO-92 XSTR NPNS SH	7022N4401	2N4401	81349
Q5	0.31W TO-92 XSTR PNPS SH	7022N4403	2N4401	81349
R1	3.3 K 1/4W 10 RES FXD COMP	651102-0332	RC07GF332K	81349
R2	4.7 K 1/4W 10 RES FXD COMP	651102-0472	RC07GF472K	81349
R3	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R4	220 OHM 1/4W 10 RES FXD COMP	651102-0221	RC07GF221K	81349
R5	150 OHM 1/4W 10 RES FXD COMP	651102-0151	RC07GF151K	81349
R6	22 K 1/4W 10 RES FXD COMP	651102-0223	RC07GF223K	81349
R7	1.5 K 1/4W 10 RES FXD COMP	651102-0152	RC07GF152K	81349
R9	50.6K 1/8W 1 RES FXD FILM	653001-5362		
R10	18.2K 1/8W 1 RES FXD FILM	653001-1822	RN55D1822F	83186
R11	51.1K 1/8W 1 RES FXD FILM	653001-5112	RN55D5112F	81349
R12	102 K 1/8W 1 RES FXD FILM	653001-1023	RN55D1023F	81349

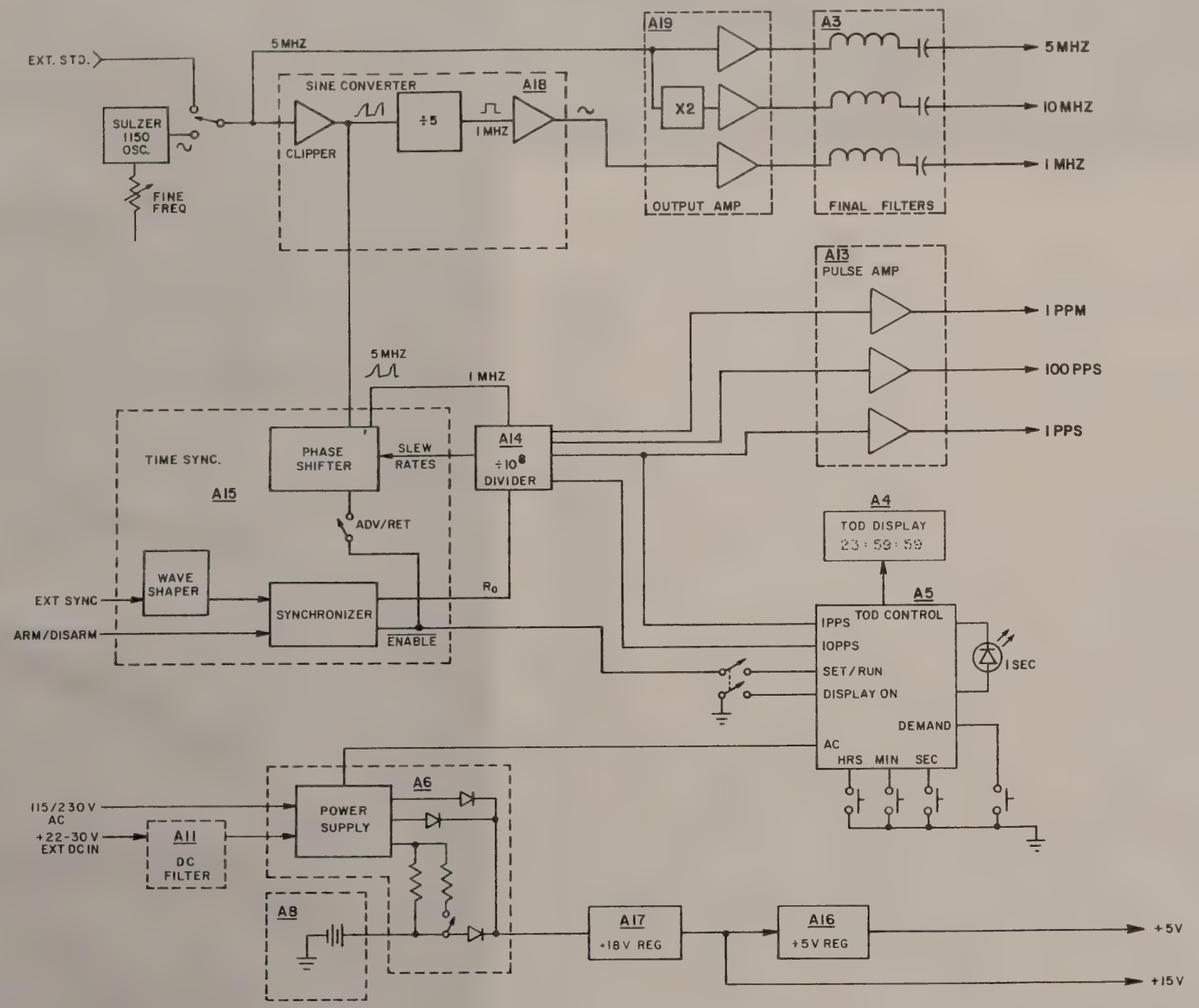
ASSEMBLY PCB ASSY, 60HZ SINE CONVERTER (CONT)
ASSEMBLY NUMBER 10396517
REFERENCE DESIGNATOR PREFIX 1A21
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R13	102 K 1/8W 1 RES FXD FILM	653001-1023	RN55D1023F	81349
R14	10 K 1/8W 1 RES FXD FILM	653001-1002	RN55D1002F	81349
R15	4.02K 1/8W 1 RES FXD FILM	653001-4021	RN55D4021F	81349
R16	1K OHM 1/4W 10 RES FXD COMP	651102-0102	RC07GF102K	81349
R17	12 K 1/4W 10 RES FXD COMP	651102-0123	RC07GF123K	81349
R18	12 K 1/4W 10 RES FXD COMP	651102-0123	RC07GF123K	81349
T1	XFMR 300KHZ 10:1	75198118		24672
U1	IC DUAL DECADE COUNTER	703SN74LS390	SN74LS390N	01295
U2	IC DUAL DECADE COUNTER	703SN74LS390	SN74LS390N	01295
U3	IC HIGH SLEW RATE OPERATIONAL AMPLF	703NE531V	NE531N	18324

7.5 MODEL 1210D-03 PORTABLE CRYSTAL CLOCK

7.5.1 The Model 1210D-03 Portable Crystal Clock has 10 MHz, 5 MHz and 1 MHz sinusoidal outputs as well as 100 PPS, 1 PPS and 1 PPM outputs. The outputs retain the specifications detailed in section 1.3. This version is the same as the model 1210D, except that the Output Amplifier (A19) has been replaced with the 10 MHz, 5 MHz, 1 MHz Output Amplifier (AUSTRON Part Number 10397342), which is covered under section 7.3.3. The Final Filter (A3) has been replaced by AUSTRON Part Number 10397355-1, covered under Figure 7-4. The Pulse Amplifier (A13) is AUSTRON Part Number 10394595-3 covered under section 4.9. The Divider (A14) has been replaced by AUSTRON Part Number 10396614-1.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD



				TOLERANCES UNLESS OTHERWISE SPECIFIED		
				DECIMALS	FRACTIONS	ANGLES
				MATERIAL		
127 96207	1210D-03		7-13	ENGR		
NEXT ASSY	USED ON	REF DES	FIG NO	CHECK		
APPLICATION				DRFTSMN	LDP	4-6-78

AUSTRON INC
AUSTIN, TEXAS

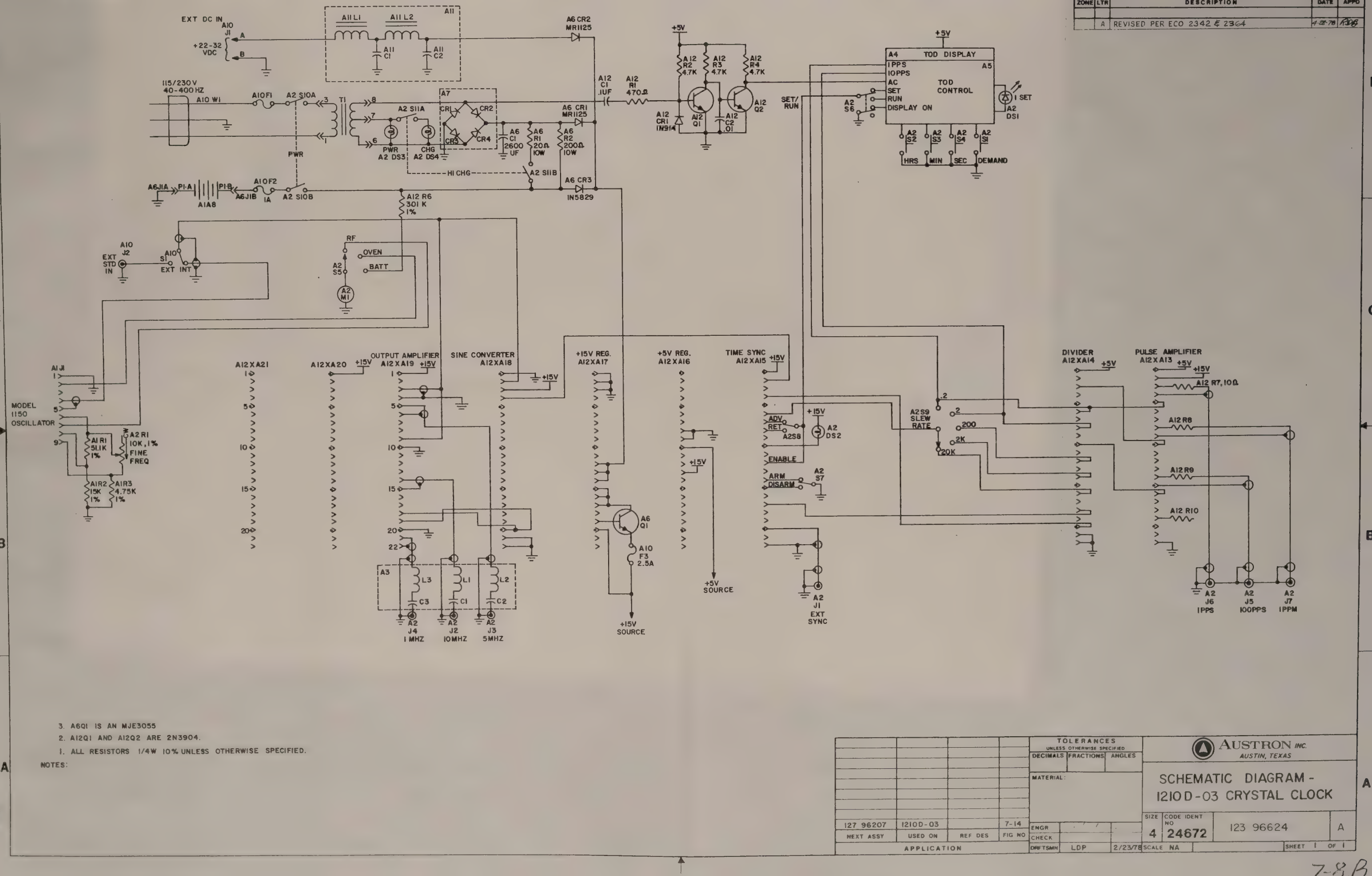
BLOCK DIAGRAM
1210D-03 CRYSTAL CLOCK

SIZE	CODE IDENT NO	
3	24672	124 96625

SCALE NA SHEET OF 1

7-8A

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	A	REVISED PER ECO 2342 & 2364	4-28-78	RDB



3. A6Q1 IS AN MJE3055
2. A12Q1 AND A12Q2 ARE 2N3904.
1. ALL RESISTORS 1/4W 10% UNLESS OTHERWISE SPECIFIED.

NOTES:

127 96207	1210D-03		7-14
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED
DECIMALS | FRACTIONS | ANGLES
MATERIAL:

ENGR		
CHECK		
DRFTSMN	LDP	2/23/78

AUSTRON INC. AUSTIN, TEXAS

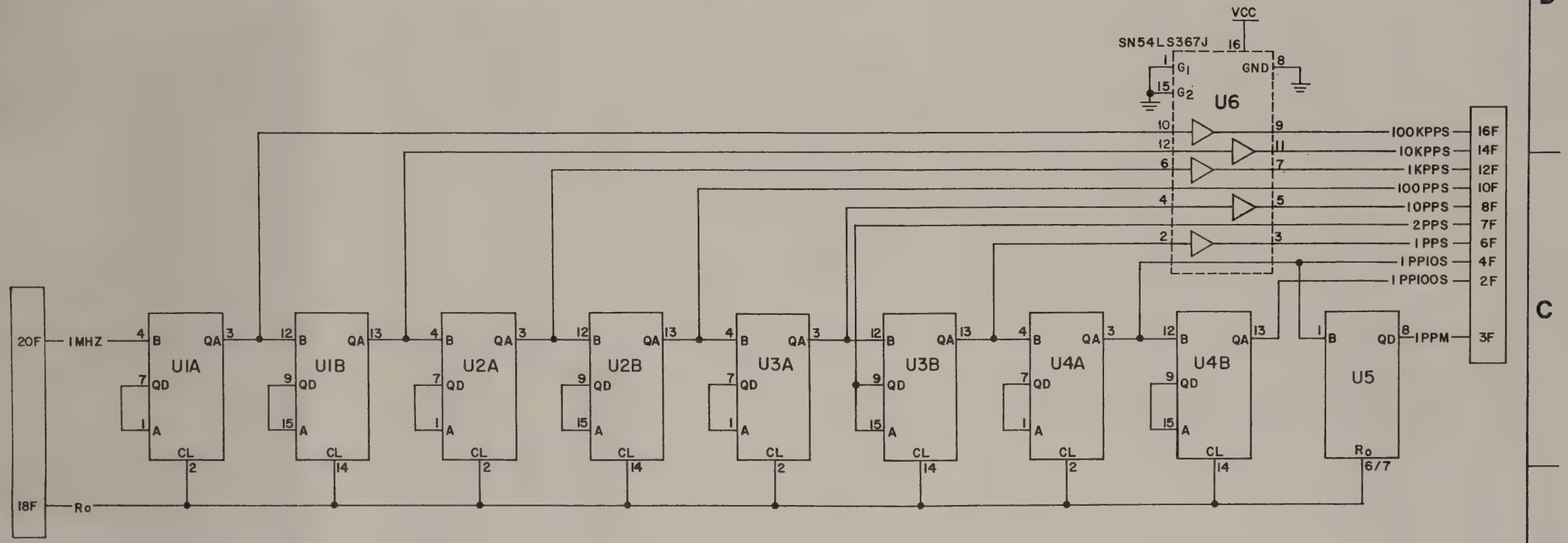
SCHEMATIC DIAGRAM - 1210D-03 CRYSTAL CLOCK

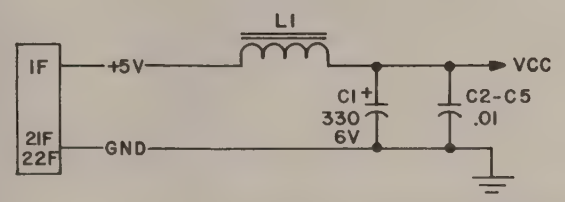
SIZE	CODE IDENT NO		
4	24672	123 96624	A

SCALE NA SHEET 1 OF 1

7-8B

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	4-24-79	RWB
	A	ADDED U6 TO ECTH & SCREEN PER E.C.O. #3037	9-13-79	CAT
	B	U6 PIN 10 WAS 8; U6 PIN 12 WAS 10; PER ECO 3177	11-14-79	ROB





3. U4, U5 AND C5 ARE USED ON 103 96614-1 ONLY.
2. U5 IS A SN54LS92J -VCC/5 GND/10.
1. U1 THRU U4 ARE SN54LS390J -VCC/16 GND/8

NOTES:

103 96614-*	1210D-03	A14	7-15
NEXT ASSY	USED ON	REF DES	FIG NO

APPLICATION

TOLERANCES UNLESS OTHERWISE SPECIFIED

DECIMALS	FRACTIONS	ANGLES

MATERIAL: N/A

ENGR		
CHECK		
DRFTSMN	LDP	4-19-78

AUSTRON INC.
AUSTIN, TEXAS

SCHEMATIC, DIVIDER

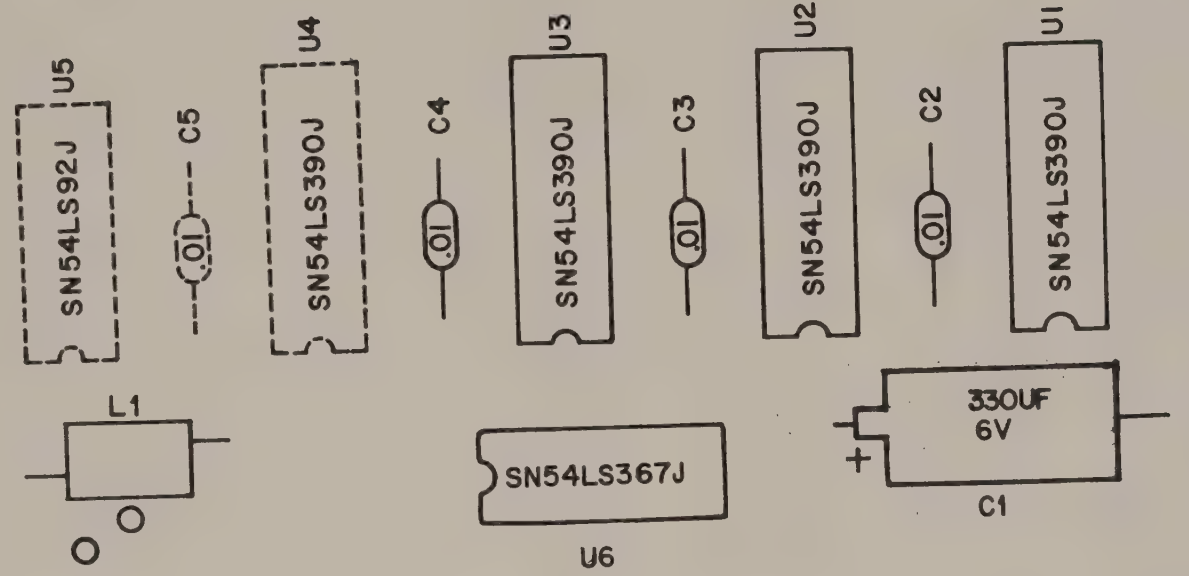
SIZE	CODE IDENT NO	
3	24672	123 96615

SCALE N/A SHEET 1 OF 1

7-8C

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	—	RELEASED	4-24-78	RDB
	A	ECO. 2376 PARTS LIST CHANGE	5-17-78	RDB
	B	ADDED FEED-THRU'S TO SCREEN ECO. 2712	3-16-79	RDB
	C	REVISED PARTS LIST PER ECO. 2884	4-16-79	RDB
	D	REVISED ETCH & SCREEN PER ECO. 3037	9-13-79	JW

103 96614



NOTES:

1. U4, U5, AND C5 ARE USED ON 103 96614-1 ONLY.

271 96208-3	1210D -03	A14	7-16
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			

TOLERANCES UNLESS OTHERWISE SPECIFIED		
DEC	FRAC	ANG
MATERIAL: N/A		
ENGR	RDB	5-2-78
CHECK	[illegible]	4/24/78
DRFTMN	LDP	4-20-78

AUSTRON INC
AUSTIN, TEXAS

PC BOARD ASSY, DIVIDER

SIZE	CODE IDENT NO		
2	24672	103 96614-*	D
SCALE N/A		SHEET 1 OF 1	

7-8D

7.5.2 Divider -- The Divider PCB (A14) contains provisions for four cascade dual-decade dividers, as well as a divide-by-six stage.

7.5.2.1 The 1 MHz TTL output from the Time Sync card is divided (by means of three cascade dual-decade dividers) to 1 PPS. This and other intermediate rates are used by the TOD Control (A5), the Time Sync (A15), and the Pulse Amplifier (A13).

7.5.2.2 The fourth dual-decade divider and the divide-by-six stage are used to generate the 1 PP10S, 1 PP100S, and 1 PPM respectively. These are special options, and used on the 10396614-1 assembly only.

7.5.2.3 The Hex Driver (U6) is used to buffer the slew rates applied to the front panel slew rate switch (1A2S9). This prevents the capacative loading of the switch from giving the dividers a false count.

7.5.2.4 The $R_{\emptyset}$ signal originates on the Time Sync card (A15), and is used to reset all dividers when synchronizing the clock to external source.

ASSEMBLY CRYSTAL CLOCK, MODEL 12100-03
ASSEMBLY NUMBER 32196206-3
REFERENCE DESIGNATOR PREFIX
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	PCB ASSY, EXTENDER	10393765		24672
	MANUAL	12796207		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONN MS-TYPE 3-PIN FEMALE	551106-0017	MS3106A-14S-1S	74861
	TUNING WAND	901000-8605	8605	20018
1	FINAL ASSY, MODEL 12100-03	32196208-3		24672

ASSEMBLY FINAL ASSY, MODEL 1210D-03
ASSEMBLY NUMBER 27196208-3
REFERENCE DESIGNATOR PREFIX 1
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	NOT USED			
A2	PANEL ASSY, FRONT	10996193-3		24672
A3	PCB ASSY, FINAL FILTER	10397355-1		24672
A4	PCB ASSY, TOD DISPLAY	10396186		24672
A5	PCB ASSY TOD CONTROL	10396188		24672
A6	PLATE ASSY	11096211		24672

ASSEMBLY PCB ASSY, BRIDGE
ASSEMBLY NUMBER 10394664
REFERENCE DESIGNATOR PREFIX 1
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A8	BATTERY PACK ASSY	12096212		24672
A9	XTLOSC, 1150 (70-85 DEG)	30296818		24672
A10	PANEL ASSY, REAR	10996195		24672

ASSEMBLY PCB ASSY, DC FILTER
ASSEMBLY NUMBER 10396200
REFERENCE DESIGNATOR PREFIX 1
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A12	PCB ASSY, INTERCONNECT	10396769		24672
A13	PCB ASSY, PULSE AMPLIFIER	10394595-3		24672
A14	PCB ASSY, DIVIDER	10396614-1		24672
A15	PCB ASSY, TIME SYNC	10394618		24672
A16	PC BOARD ASSY T5VDC REGULATOR	10394607		24672
A17	PCB ASSY, +15 VDC REGULATOR	10396197		24672
A18	PCB ASSY, SINE CONVERTER	10396025-1		24672
A19	PCB ASSY, 10,5,1 MHZ OUTPUT AMP	10397342		24672
A20	NOT USED			
A21	NOT USED			
MP1	COVER, FRONT	00794304		24672
MP2	COVER INSTRUMENT	00796209-1		24672
MP3	COVER INSTRUMENT	00796209-2		24672
MP4	BAR RECTANGULAR	01096753		24672
MP5	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP6	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP7	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP8	.171X1/4X1/2 SPACER ROUND	520830-0005	9228-PH1710	06540
MP9	WASHER, PRELOAD	02096741		24672
MP10	WASHER, PRELOAD	02096741		24672
MP11	WASHER, PRELOAD	02096741		24672
MP12	WASHER, PRELOAD	02096741		24672
MP14	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP15	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP16	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP17	SHOCK MOUNT BUSHING	520205-0005	10R4-1501B	14519
MP18	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP19	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP20	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP21	SHOCK DRIVE WASHER	520205-0010	10R41500	14519
MP22	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP23	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330
MP24	BUMPER, RUBBER W/HARDWARE	520210-2198	2198	83330

ASSEMBLY PCB ASSY, DC FILTER (CONT)
ASSEMBLY NUMBER 10396200
REFERENCE DESIGNATOR PREFIX 1
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART		MFG PART	FIC
MP25	BUMPER, RUBBER W/HARDWARE	520210-2198	2198		83330

ASSEMBLY PCB ASSY, DIVIDER
ASSEMBLY NUMBER 10396614-1
REFERENCE DESIGNATOR PREFIX 1A14
QUANTITY EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	330 UF 6V 10 CAP TANT	608013-0337	CS13BB337K	81349
C2	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C3	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C4	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
C5	.01 UF 100V 10 CAP CERAFIL	601205-0103	CK12BX103K	81349
L1	CHOKE, WIDEBAND	751102-0000	VK20010/3B	02114
U1	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U2	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U3	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U4	IC DUAL DECADE COUNTER	703SN54LS390	SN54LS390J	01295
U5	IC DIVIDE BY TWELVE COUNTER	703SN54LS92J	SN54LS92J	01295

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